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The AUTOMOBILE

Motor Spirit To Solve Fuel Problem for the Passenger Car

Its Substitution for Gasoline as a Fuel for Commercial Vehicles, Stationary Engines, Etc., Will Lighten the Overwhelming Demand—Present Production 15,000 Gallons a Day

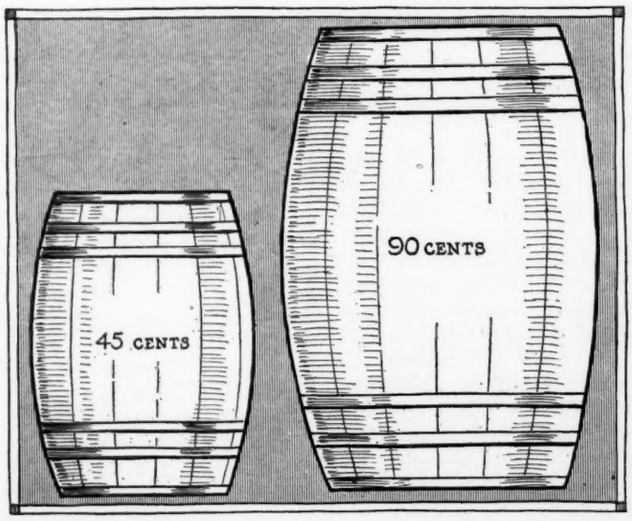
CHICAGO, ILL., Feb. 24—July 3, 1912, gives promise of being recorded as an epoch-making day in automobile history. It was on this date that W. M. Burton, a director and general superintendent of the refinery of the Standard Oil Company of Indiana, made his application to the United States patent office for a patent covering a new method of manufacturing gasoline from crude oil, by which process it became possible to more than double the output of motor fuel from the crude product.

On January 7, 1913, the *Patent Gazette*, the official weekly publication of the patent office, contained a notice of issuing patent No. 1,049,667 to Dr. Burton, this patent covering in brief distilling the product at temperatures from 650 to 850 degrees Fahrenheit and under pressures of 4 to 5 atmospheres.

The process of distillation covered by this patent has been in operation since May, 1912, when the first distillate was produced. This distillate, officially labeled motor spirit, is now being produced in quantities of 15,000 gallons daily and by June it will be produced in much larger quantities.

As reported in last week's issue of THE AUTOMOBILE, motor spirit is a new product of crude oil, which is manufactured from the fuel oil residue, this being that portion remaining after gasoline, kerosene, lubricating oil and the other distillates have been taken off. This fuel oil was used by large industrial concerns instead of coal as fuel for heating their boilers. It constituted almost 50 per cent. of the crude volume. By means of Dr. Burton's new process, the Standard Oil Company of Indiana, to which the patent was assigned, is enabled to produce from the original crude oil a greater quantity of fuel for internal combustion motors. In a word, this company at its refinery at Whiting, Ind., a Chicago suburb, gets from the crude its regular 20 per cent. volume of gasoline and an additional amount of the fuel motor spirit, which spirit with a Beaumé gravity of 56 to 57 is very much the same as gasoline, excepting for a strong pungent odor.

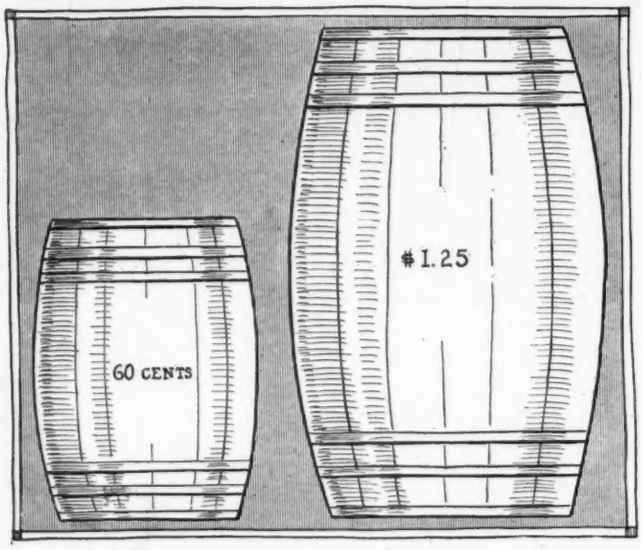
This motor spirit looks practically the same as the regular 59 Beaumé gravity gasoline which the automobilist has been buying all over the country during the past year. In color it has a slightly yellow tinge, which is not perceptible unless looked for; in fact, so closely does motor spirit resemble gasoline that if sample bottles of the two are placed side by side it calls for a careful scrutiny to distinguish one from the other when new. After the motor spirit stands for some days or weeks its yellow tint increases slightly.



In round numbers, crude oil prices have doubled in the last 12 months. Kansas and Oklahoma crude, which a year ago sold for 45 cents a barrel at the wells, to day is selling at 90 cents

The odor of motor spirit is scarcely so favorable. It is stronger and more pungent than gasoline. Once in the gasoline tank of a car a passenger cannot tell whether motor spirit or gasoline is being used, but should some be spilled on the car cushions or floor the odor might prove unpleasant until the fluid evaporates when the odor disappears. Its evaporation is much slower than that of gasoline, due to the higher boiling point of the motor spirit as compared with gasoline.

So far as carburetion is concerned, motor spirit offers few if any difficulties, not calling for additional carbureter refinements, but being adopted



Just 1 year ago Illinois crude sold at the wells for 60 cents a barrel. Today it is selling at $1.25

for the conventional gasoline carbureter by adjusting to give greater quantities of air in proportion to the fuel volume, an alteration made necessary by the higher boiling point of motor spirit and the greater number of heat units in it per volume when compared with gasoline. Cars fitted with dash controls for the auxiliary air supply are specially well suited for using this fuel.

Motor Spirit To Serve Trucks

There is a slight, light-colored smoky exhaust, not as pronounced as the bluish oil exhaust from many cars. Passenger cars using motor spirit have been traversing the Chicago boulevards for weeks without any interference from the police, who have instructions to arrest or put off the boulevard system any drivers of cars with smoky exhaust. The present grayish exhaust from motor spirit may be entirely eliminated by a better water-jacketing of the intake manifold between the carbureter and the valve chambers, this being done to prevent the condensation of the heavier parts of the motor spirit.

There is a slightly increased carbon deposit in the combustion chambers due to the use of the new fuel. This carbon, however, is of a relatively soft consistency and may be readily removed without resorting to scraping. Cars employing motor spirit continuously have experienced little more trouble from carbon deposits than those using more ordinary grades of fuel. It has been noted that scarcely as much motor lubrication is needed with the new fuel as with gasoline. Starting in cold weather is not attended with any greater difficulties than with gasoline.

Primarily motor spirit is not intended for the users of pleasure cars, but there is nothing to prevent its use by them as to many it will be attractive, being 3 cents per gallon cheaper and giving approximately 25 per cent. increased fuel efficiency. **Motor spirit is intended for motor trucks, for traction engines, for stationary engines and gas engines generally in which gasoline has been used during the past year, and due to which use the gasoline market has been so short of late. With motor spirit taking the place of gasoline for these fields, then the supply of gasoline will be obtainable for the passenger car field, and for which it will prove adequate for years to come unless unforeseen exigencies arise.**

Coming then as a substitute for gasoline in these fields the car owner should be able to rid himself of the nightmare of possible increases in the price of gasoline, such as were experienced in Europe last season, when local exigencies presented themselves. With the present supply of crude oil from the various American crude-oil fields, there is no necessity for any appreciable rise in gasoline prices during the coming season. Those who have given careful study to the subject anticipate a rise of a few cents, but should the present wild-catting in the crude oil fields result in sinking many productive wells it is certain that the price of crude may drop to the level of last year.

The phenomenal and unexpected increase in the price of crude oil has been largely responsible for the increase in the price of gasoline during the past year. In round numbers crude oil prices have doubled in the past 12 months. Kansas and Oklahoma crude which a year ago sold at 45 cents a barrel at the wells is today selling at 90 cents. One year ago Illinois crude sold at 60 cents per barrel at the wells and is today selling at $1.25.

The increase in prices of crude must not be looked upon as an exhaustion of the supply within the grounds but rather an increase of demand by the refineries beyond the producing capacities of the wells. Some years ago owners of crude oil wells were making little money. The supply was vastly in excess of the demand. With the increased demand due to increased use of automobiles, there came a drawing on the available stored crude supply, which was equal to the requirements of two seasons. Immediately the prices of the crude began rising and they have continued consistently ever since. With the increased demand and increased price there has been great activity in sinking wells in the crude territories; and this promiscuous sinking of wells, or wild-catting as it is known, may result in vast increases in crude supplies or it may not. Some experts on the supply of crude oil believe that there is not a sufficient quantity of crude west of the Rocky Mountains to meet the requirements.

That there was an embarrassing shortage in gasoline up to the present is borne out by statistics, which show that on January 1, 1912, some of the gasoline producing companies had many millions of gallons of gasoline stored for immediate use, whereas on January 1, 1913, some of these same concerns had practically exhausted their stored supplies and were furnishing fuel in a hand-to-mouth fashion. Rumors had it that the gasoline producers had failed to calculate on the gasoline consumption of motor trucks, but it is a matter of record that these producers had taken due recognition of this factor and were exerting every influence to ward off a situation, the shadow of which had been hanging over them for many months.

By traction engines, stationary engines, motor trucks, etc., using motor spirit the surplus of gasoline should begin accumulating. Statistics from a western state shows that during the past fall, the traction engines, used in threshing the grain and hauling it to market, consumed six times as much gasoline as the automobiles in the same territory; statistics further proved that stationary engines in elevators were using more gasoline than was sold direct to garages to the automobile industry. While this was true in the fall, winter brought on a different condition of affairs, one in which the consumption of gasoline by traction engines practically ceased and when they were large purchasers of gasoline, a large portion of which they retail to motor car users.

Many Possible Fuels Existing

Every shortage in fuel supply is certain to stimulate thoughts of the possible exhaustion of crude supplies, and the active brain soon becomes lost in the labyrinth of emergency possibilities. America has boundless fields of crude. Some of the better known crude oil fields are California, Texas, Kansas and Oklahoma, Missouri, Illinois, Ohio and Indiana and Pennsylvania. There is not a symptom of danger of immediate exhaustion of these, but should such be precipitated there are many foreign fields from which crude could be imported at reasonably low cost. But in the extreme if the crude oil supply were not adequate or entirely disappeared, then attention would have to be turned to the use of alcohol as fuel. Alcohol could be manufactured from corn, and the present output of gasoline could be replaced by alcohol and the amount of corn needed would not be over 3 per cent. of the annual crop.

The production of motor spirit today is entirely in the hands of the Standard Oil Company of Indiana, which owns the

patent, and because of this it is very questionable if motor spirit will be marketed country-wide for a matter of a year or so. It will soon be marketed at many points in the territory between the Great Lakes and the Rockies. There are today upwards of 140 concerns producing gasoline and it will apparently be necessary for these to take out royalties if they intend to refine motor spirit.

The refining process is more difficult and costly than the refining of gasoline due to the pressure of 4 to 5 atmospheres used in the stills. At present there are a number of special motor spirit stills in operation and by June there will be many more producing, which will be a sufficient equipment to meet the expected demand. With these stills it will be possible to convert a considerable portion of the residue known as fuel oil into motor spirit, the final residue being a marketable product for other uses.

Dr. Burton has been working on the process for upwards of 3 years and has been materially assisted by Dr. R. E. Humphreys, chief chemist of the Standard Oil Company of Indiana, and other associates. Since the original product was secured many improvements have been made in it and it is certain that before another year has elapsed that others will be made. The present pungent odor could readily be eliminated, but its elimination would mean largely reducing present output, which would prove too expensive to the industry.

Motor spirit is at present being used by over a dozen different industrial concerns in Chicago, mostly in the operation of motor trucks. It has been used by some of these for a matter of 10 days in average winter weather and not the slightest difficulty has been encountered in its use.

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Belgium's Status in Automobile Industry

BRUSSELS, Feb. 20—Official statistics show that there are 23 automobile factories in Belgium employing 5,217 workmen. In 1909 the Belgian production of chassis and motors was 2,171; in 1910 it was 3,020; in 1911 4,850; the returns have not yet been published for 1912. During 1912 Belgium exported automobiles and bodies to the value of $6,203,563, and during 1911 to the value of $5,108,290. Belgium is not self-sufficing in the matter of automobile construction, for in 1911 she imported French automobiles to the value of $5,495,280, and to the value of $8,660,640 in 1912.

In addition to the automobile factories there are 50 important body makers in Belgium employing 3,030 workmen. In 1909 they delivered 1,213 complete bodies; in 1910, 2,617 bodies, and in 1911, 3,496. The official returns show that in 1908 the number of automobiles registered with the police authorities was 9,840; in 1909 it was 11,500, and in 1910, 14,620. Figures have not been issued for the last two years.

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New Aluminum Foundry to Open

WAUKESHA, WIS., Feb. 24—A new aluminum foundry, which will make a specialty of castings for the motor car and engine trade, is now being established at Waukesha, Wis., by Conrad Werra, of Manitowoc, Wis., a pioneer in the aluminum foundry business of Wisconsin, and until now general manager of the Aluminum Castings Company of America's Manitowoc works, formerly the Aluminum Foundry Company, which was founded and owned by Mr. Werra for 14 years. Mr. Werra has organized the Werra Aluminum Company of Waukesha and incorporated it for $110,000. With him is associated Alexander Pankratz, factory superintendent of the Manitowoc works, who resigned February 15 to become manager at Waukesha. The new company has leased the former Wisconsin Central ("Soo Line") car shops and division headquarters group at Waukesha for a long term of years and is now installing equipment which will make the plant one of the largest aluminum foundries in the Middle West, it being three times as large as the former Werra plant at Manitowoc. It will be ready for operations about March 15.

New York Merchants Want Car Factories

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Merchants' Association Studying Automobile Industry with a View To Attracting Motor Vehicle Business

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Freight and Labor Facilities Declared to Be Excellent—Bankers Would Support Healthy Enterprises

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MERCHANTS of New York City, represented by the Merchants' Association of New York, founded to foster the trade and welfare of this city, want automobile and automobile accessory factories. Tuesday night, at an informal dinner attended by twenty of the representative automobile men of New York and vicinity, tendered by the industrial bureau of the association, the possibilities of securing factories in this line of business were discussed. Henry Morgenthau, chairman of the Industrial Committee, presided over the informal debate which took place after the dinner. Dr. E. E. Pratt introduced the discussion by giving a statement of facts which he had gathered from the leading automobile men of the city and the state bureau of labor. He pointed out the fact that skilled labor was readily obtainable in New York City in such quantities that the manufacturer was able to pick and choose. He also showed the transportation facilities to be of the best.

A point which brought out some discussion was the living facilities for the lower-paid labor. It was shown that in the Borough of Queens it is possible to secure four rooms and bath for a monthly rental of $14. This territory is within easy walking distance of excellent factory sites which could be secured at a cost in the neighborhood of $1,000 for a lot of 25 by 100 feet. This compares favorably, according to statements of those present, with other cities which have become automobile manufacturing centers in which living quarters of the laboring class are not only inadequate but are separated from the factory by transportation facilities which cannot meet the demand.

It was also stated upon the authority of men who have studied the banking situation in New York City very closely that, while the moneyed interest looked askance at investments in the automobile field during the early stages of the industry, it would now be comparatively easy for a substantial concern to secure a loan. This was stated to be particularly true of the motor truck industry. Maps were produced showing the enormous buying range of New York City, circles being laid out with New York City as the center. It was stated that within a radius of 400 miles 65 per cent. of the output of the motor vehicle factories is consumed. The association particularly dwelt upon the advantages of manufacturing trucks so that they could reach this vast market under their own power and thus save freight charges.

It was stated by several present from both the merchants' association's and the automobile men's viewpoint that New York offers unparalleled opportunities to the manufacturers of automobile tires and other accessories.

The fact that the Goodyear company has determined to distribute tires from Long Island City to help take care of the enormous consumption of the New York market was cited as an indication that these companies were beginning to realize the advantages of being close to the market.

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Clifford M. Nouggy, formerly with the Stover Bicycle Company and also with the Daimler Manufacturing Company of Long Island City, is now with J. S. Bertz Company, New York City, importers of F. & S. ball bearings.

W. M. Lewis Retires

Mitchell-Lewis Motor Car Company's President and General Manager Succeeded by J. Winterbotham, Jr.

His Only Reason for Retirement Is To Give Entire Attention to Other Interests

RACINE, WIS., Feb. 24—Captain William Mitchell Lewis, president and general manager of the Mitchell-Lewis Motor Car Company, of Racine, Wis., on Wednesday, February 19, retired as active head of the company and is succeeded by J. Winterbotham, Jr. The only reason given for Captain Lewis' retirement is that he desires to give his entire attention to his other interests, which include the Racine Rubber Company, the Racine Daily Times Company, publishing the leading daily newspaper of Racine and other enterprises of equal or lesser importance. Captain Lewis established his offices in the Racine Times building immediately upon retiring from the motor works.

Reports of financial difficulties circulated in connection with the retirement of the president and general manager and since denied by company officials stated that the company had defaulted on the payment of the installment due on a loan of $2,500,000 made by the Mitchell-Lewis Motor Company 1 year ago and now due, and that Captain Lewis had been supplanted as head of the interest that the committee of bankers representing the institution which had advanced the $2,500,000 loan might take active charge of the direction of the company's affairs for the protection of the loan.

The Mitchell-Lewis Motor Company was organized and incorporated in 1910 with a capital stock of $10,000,000, being a consolidation of the Mitchell Motor Car Company and the Mitchell-Lewis Company, Ltd., the former being a manufacturer of motor cars and the latter a manufacturer of wagons. The interests of both companies had long been practically identical in a financial way. Captain William Mitchell Lewis was elected president and general manager, he having been president of the motor car company, and William T. Lewis was elected chairman of the board of directors, he having been head of Mitchell-Lewis Company, Ltd.

Hofwebers To Build Cheap Car

LACROSSE, WIS., Feb. 24—The Hoff Motor Company is being organized here by Joseph E. and August H. Hofweber, and will be incorporated with a capital stock of $1,000,000 to manufacture automobiles. The Hofwebers have gained the support of leading business and professional men in their project to build and market a pleasure car under the name Hoff, designed by them and to sell at $790 fully equipped.

Columbus Buggy Plan Not Ripe

COLUMBUS, O., Feb. 24—The committee named by the creditors of the Columbus Buggy Company of this city, which went into the hands of Daniel McLarin as receiver recently, will not formulate a plan of reorganization until after the appraisers named by the federal court will report on the assets of the corporation. It was believed that more intelligent work could be done by the committee after the appraisers' figures were made. The appraisers are expected to report in a few days.

Maxwell Plants Turning Out Cars

DETROIT, MICH., Feb. 24—The Maxwell Motor Company, Inc., is gradually getting its affairs in shape and squared away for the active manufacture of the several models which have been announced. The general offices at Warren and Woodward streets are being fitted out and will soon become the pulse of the big concern. The Brush plant is now running and will be devoted to the exclusive manufacture of the Maxwell 25. Equipment is being brushed up and machinery added here. At the Alden-Sampson plant, which has been more or less inactive since the reorganization proceedings were begun, all is activity again and trucks are being manufactured. The plant at Dayton, O., is operating at full force and is to turn out model 35. The Flanders plant is also busily engaged in the production of several models. Altogether the outlook is very favorable for a year of excellent production under the new régime in spite of the difficulties which have been handicapping the company in organization.

Findlay Plant to Original Promoter

FINDLAY, O., Feb. 24—The recent sale of the Findlay Motor Company plant to W. W. Edwards for $50,000, now turns out to be for Mrs. L. E. Ewing, of Cleveland, wife of the original promoter of the company. Mr. Ewing is on the ground attempting to dispose of the property. He announces that he is willing to take stock in the new company, of the purchaser of the plant who will buy it and reorganize the company.

Poss Company Assets To Be Sold

DETROIT, MICH., Feb. 24—Charles D. Todd has offered at private sale commencing today the entire assets of the Poss Motor Company, bankrupt, which were purchased from Referee in Bankruptcy Lee E. Joslyn at a hearing on February 21. The sale includes the good will of the Poss concern and the right to use the name. The property consists of nine finished Poss delivery trucks, ten chassis nearly completed, fifty-five various

Automobile Securities Quotations

During this week, the stock market recovered from the collapse experienced last week due to the outbreak of the tire strike and Firestone common advanced 40 and Goodyear common 65.

	1912 Bid	1912 Asked	1913 Bid	1913 Asked
Ajax-Grieb Rubber Co., com	..	..	150	175
Ajax-Grieb Rubber Co., pfd	..	..	95	99
Aluminum Castings, pfd	..	..	100	101
American Locomotive Co., com	35¼	37	32	32½
American Locomotive Co., pfd	104½	105½	104	104½
Chalmers Motor Company	..	..	135	145
Consolidated Rubber Tire Co., com	10	20	18	21
Consolidated Rubber Tire Co., pfd	25	40	..	86
Firestone Tire & Rubber Co., com	200	204	265	275
Firestone Tire & Rubber Co., pfd	108	110	103	105
Fisk Rubber Co., com	..	..	..	..
Fisk Rubber Co., pfd	..	..	102	103
Garford Company, preferred	..	..	99	100
General Motors Company, com	30½	31	32	32½
General Motors Company, pfd	74½	76	74	75
B. F. Goodrich Company, com	..	..	37½	39
B. F. Goodrich Company, pfd	..	..	94	96
Goodyear Tire & Rubber Company, com	338	342	365	375
Goodyear Tire & Rubber Company, pfd	108	110	..	100
Hayes Manufacturing Company	..	..	..	90
International Motor Co., com	..	..	5	15
International Motor Co., pfd	..	..	35	55
Lozier Motor Company	..	..	27	32
Miller Rubber Company	..	..	150	160
Packard Motor Company	104	107	102	105
Peerless Motor Company	..	..	120	125
Pope Manufacturing Co., com	40	43	..	30
Pope Manufacturing Co., pfd	74	77	..	75
Reo Motor Truck Company	8	10	11½	12½
Reo Motor Car Company	23½	25	20½	21½
Rubber Goods Mfg. Co., pfd	100	105	104	107
Studebaker Company, com	..	..	28	29½
Studebaker Company, pfd	..	..	88	93
Swinehart Tire Company	..	..	88	95
U. S. Motor Company, com	..	..	..	8
U. S. Motor Company, 1st pfd	..	..	..	65
U. S. Motor Company, 2nd pfd	..	..	..	35
U. S. Rubber Co., com	45	45½	59	60
U. S. Rubber Co., 1st pfd	109½	110½	104½	105¾
White Company, preferred	..	..	103	107
Willys-Overland Company, com	..	..	61	67
Willys-Overland Company, pfd	..	..	91	98

types of bodies and other miscellaneous parts, in addition to several machine tools. The goods will be sold in parcels or as a whole if a suitable offer is made.

In purchasing the property from the referee, C. D. Todd paid $5,500 in cash and agreed to turn over 85 per cent. of the amount realized from the present sale. Assets of the Poss company amount to $37,297.86, according to the inventory.

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Exports for 1912 Were $28,308,118

WASHINGTON, D. C., Feb. 25—(*Special Telegram*)—The exports of automobiles and parts for 12 months ending December, 1912, totalled $28,308,118. The total for December, 1912, was $2,428,176, that for the 12 months ending December, 1911, was $19,178,484. Imports for 12 months ending December, 1912, were $2,275,406, a decrease as compared with the same period for 1911.

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Harroun Making Novel Carbureter

INDIANAPOLIS, IND., Feb. 24—Ray Haroun, the Memorial Day race hero of 1911, has incorporated the Ray Harroun Company for the manufacture of a heavy-fuel carbureter. The latter is a single-jet, automatic adjustment design, hot-air jacketed. The only regulation is by a dash control.

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The Bloomfield, N. J., factory of the Simms Magneto Company which was put in operation again after the reorganization of the company in fall, 1912, is now operating at the rate of fifty magnetos a day. The product is partly being shipped and partly laid up in stock. The manufacture of S-U carbureters is also proceeding at a fair rate and it is expected that the production of this accessory will be increased materially during the year.

Market Changes of the Week

Of the few changes in the markets this week tin was the most important, a drop of $1.37 per hundred pounds occurring, due to breaks and violent fluctuations in standard contracts at London. Lead was dull but steady being called for at $4.30 per 100 pounds. Bessemer steel rose $.50 per ton. Cottonseed oil suffered a loss of $.07 per barrel owing to the recent holiday. No new features of importance appeared in the market for scrap rubber last week. According to importers, the demand for foreign rubber holds up well, the request embracing all grades, and prices are apparently firm on both sides of the water. Automobile scrap is called for at $.09 7-8. Copper was weaker in all positions, with small buying of refined either here or in Europe. Both coppers fluctuated throughout the week, closing at Wednesday's prices. There were no changes in both Pennsylvania and Kansas petroleums.

Material	Wed.	Thurs.	Fri.	Mon.	Tues.	Change
Antimony, per lb.	.08¼	.08¼	.08¼	.08¼	.08¼	.....
Beams & Channels, 100 lbs.	1.61	1.61	1.61	1.61	1.61	.....
Bessemer Steel, ton.	28.50	28.50	28.50	29.00	29.00	+.50
Copper, Elec., lb.	.14⅝	.14⅝	.14¾	.14⅝	.14⅝	.....
Copper, Lake, lb.	.14¾	.14¾	.14¾	.14¾	.14¾	.....
Cottonseed Oil, Feb., per bbl.	6.35	6.30	6.25	6.28	6.28	—.07
Cyanide Potash, lb.	.19	.19	.19	.19	.19	.....
Fish Oil, Menhaden, Brown	.33	.33	.33	.33	.33	.....
Gasoline, Auto, 200 gals.	.22¼	.22¼	.22¼	.22¼	.22¼	.....
Lard Oil, prime.	.90	.90	.90	.90	.90	.....
Lead, 100 lb.	4.30	4.30	4.30	4.30	4.30	.....
Linseed Oil.	.50	.50	.50	.50	.50	.....
Open-Hearth Steel, ton.	29.00	29.00	29.00	29.00	29.00	.....
Petroleum, bbl., Kansas crude	.88	.88	.88	.88	.88	.....
Petroleum, bbl., Pa., crude	2.50	2.50	2.50	2.50	2.50	.....
Rapeseed Oil, refined.	.68	.68	.68	.68	.68	.....
Silk, raw Japan.	....	3.72½	....	3.72½	3.72½	.....
Sulphuric Acid, 60 Beaumé.	.90	.90	.90	.90	.90	.....
Silk, raw Italy.	....	4.30	....	4.30	4.30	.....
Tin, 100 lb.	49.25	48.50	48.50	47.85	47.88	—.37
Tire Scrap.	.09⅞	.09⅞	.09⅞	.09⅞	.09⅞	.....

Akron Strike Is Broken

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All the Factories Are Ready for Active Work As Result of Return of 2,000 Men

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Goodyear To Start Work on Immense Plant—Goodrich Net Earnings for 9 Months $3,522,488

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AKRON, O., Feb. 25—(*Special Telegram*)—The backbone of the rubber workers' strike here started by the Industrial Workers of the World, which has been on 2 weeks, broke today when nearly 2,000 of the workers returned to work. The I. W. W. leaders were no longer able to hold the men. As a result of the stampede on the part of the men to get back to work all the factories will be in full running order in 2 or 3 days. It is claimed that the I. W. W. strike agitators will now move on to Paterson, N. J. The rush of men at the Goodrich, Diamond, Firestone and Goodyear plants was so great today that it was impossible to place them. At the Firestone plant, where the strike started, H. S. Firestone, president, said:

"The men are coming back faster than we can adjust our departments to care for them."

Announcement was made today that the Goodyear Tire and Rubber Company, now that the strike is over, will start work at once on the largest building in the country for rubber manufacturing purposes. It will be over 1,000 feet long and five stories high and will be built on the site of the present group of Goodyear buildings. It will employ 2,000 additional men. Indications at this time are that every rubber plant here will be running night and day within 2 days.

The Goodrich statement to stockholders today shows that the net earnings for 9 months were $3,522,488. After the preferred dividend of $1,519,505, or three dividends at the rate of 1¾ per cent. quarterly, there was remaining $2,002,984 for the common. This is at the rate of 3 1-3 per cent. for 9 months or 4.44 for a full year. There were paid out during the period two dividends of 1 per cent. each on the common, leaving $806,235 of undivided profits for the period.

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Studebaker Profits $2,313,245 for 1912

According to the yearly report of the Studebaker Corporation, South Bend, Ind., this company during the fiscal year ending December 31, 1912, had net earnings totalling $3,125,876.15. The interest on the companies 5 per cent. serial notes, discount and commission on the same and extraordinary expenses aggregated $812,631.01, leaving net profits of $2,313,245.14. The consolidated balance sheet of the company's affairs follows in extract:

Total capital investments	$30,402,083.75
Total current assets	24,049,796.86
Total	$54,451,880.61
Capital stock outstanding	$41,026,600.00
Minority stockholders' interests	28,300.00
Total current liabilities	11,069,728.43
Special surplus account	417,008.87
Dividends paid, etc.	1,910,243.31
Total	$54,451,880.61

The automobile sales of the company showed a 10 per cent. increase over the year 1911.

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International's Giant Service Building

An eight-story service building affording 200,000 square feet of floor space and costing $1,000,000 is now being completed for the International Motor Company, at West End avenue and Sixty-fourth street, New York City.

Counter Suit Filed in Stromberg vs. Zenith

Infringement Suit On Between Two Firms—Counter Suit by Zenith—Ready for Taking of Testimony

Stromberg Will Not Come Up Before May 1—Zenith Suit Will Follow About a Month Later

DETROIT, MICH., Feb. 22—A new, interesting point in the patent litigation between the Stromberg Motor Devices Company, Chicago, and the Zenith Carbureter Company, Detroit, the former alleging infringement of its Ahara and Richard patents by the latter, which has recently filed a counter suit against the Stromberg concern for alleged infringement of the Bavery patent, has arisen from the fact that the Zenith counter suit is practically the first patent suit to be brought under the new rules of practice in the Federal courts which went into effect February 1 and which call for much simpler phrasing of bills of complaint than was customary under the old rules.

Both the Zenith and the Stromberg suits are now about ready for the taking of testimony, which will be proceeded with just as rapidly as possible, according to V. R. Heftler, president of the Zenith company. Apparently the last obstacle to prompt progress was removed last week when Judge Tuttle in the Federal court in this city, after commenting upon the desirable changes accruing from the new rules of procedure, overruled certain formal objections which had been raised by the Stromberg company's attorneys to the Zenith bill of complaint charging the former with infringement of the Bavery patent. Mr. Heftler states that the bill of complaint sought to conform with the new rules and was a genuine attempt to get away from the lengthy, labored and verbose phraseology which has in the past made patent procedure so difficult for a layman to understand.

The following is a quotation from Judge Tuttle's opinion:

"As is well known, no part of a bill of complaint for infringement of a patent, in the form that has become settled under the old equity rules, was more verbose and reiterative than the several opening paragraphs of a bill thus drafted and it strikes me that counsel for the complainant, in adopting the language found in the opening paragraph of its bill, has conformed in a most gratifying degree to the language and intent of the new rules in simplifying and abbreviating his bill of complaint. The motion to dismiss is therefore denied, and that part of new rule 29 calling for the filing of the answer within 5 days after the denial of such a motion as this, must be observed."

Mr. Heftler states that the Stromberg suit will not come up before May 1, while the Zenith counter suit will follow about a month later.

Findlay Case To Go to Court

On April 17 the case of Flatow, Finn & Company vs. The American Truck Company, the Findlay Motor Company and the Ewing American Motor Company will be heard in Supreme Court, special term, part 2, New York City.

Flatow, Finn & Company, or as the company is now styled, the Commercial Auto Company, alleges that the defendants have violated a contract closed between the plaintiff and the first mentioned of the defendant companies, which provided that the Flatow concern was to have exclusive selling rights for trucks and parts made by the American Truck Company in the territory of New York City, Long Island, Westchester County, as well as Fairfield and New Haven counties, Connecticut. This arrangement was made during October, 1910. It provided, furthermore, that if the American concern sold any trucks or parts thereof in the above specified territory, the Flatow company was to receive the difference between the list and the net price of the goods sold. On the strength of this arrangement the Flatow Company adopted the name Commercial Auto Company.

Some time after this contract had been made the American Motor Truck Company consolidated with the Findlay company. About that time the plaintiff devised a scheme by means of which large quantities of trucks could have been disposed of; it consisted in the purchase of the New York Mail Company which handles the U. S. mail in New York City. The plaintiff now alleges that this scheme was put into practice about May, 1911, when the Findlay and American companies consolidated with the Ewing firm, forming the Lockport Stamping Company. Shortly after this had taken place the Lockport concern gave notice to the plaintiff that it cancelled the contract of 1910, on the grounds that other agencies in the metropolitan territory could give it better and more profitable representation. The Commercial Auto Company now claims that the deal with the New York Mail Company was put into practice by the Lockport concern and that this company made considerable money on the deal, which would have been due to the Commercial Auto Company according to its contract.

Prest-O-Lite Tests Trade Mark

SYRACUSE, N. Y., Feb. 22—The Prest-O-Lite Company has brought a test case in Municipal Court in this city in an attempt to stop the re-use of its tanks by automobile supply dealers. The action is against the Central City Rubber Company to recover a penalty of $100, under section 367, article 24, chapter 20 of the general business laws of the State. The Prest-O-Lite Company claims to have sole use of the trade-mark name Prest-O-Lite, filed with the secretary of state last December. The name is stamped on every tank sold, and the company contends that the tanks are never sold for the purpose of allowing them to be used again.

The complaint states that the Central City Rubber Company sold Frank J. Slattery a Prest-O-Lite tank February 4 and that it was filled with acetylene different from the original contents. The case will be called February 28.

Mezger Claims Red Head Infringement

Charles A. Mezger, New York City, maker of the Sootproof spark-plug, has filed suit against the Emil Grossman Company for alleged infringement of his patent, No. 700,147, dated May 13, 1902. Following are the claims which are alleged to be infringed upon by the Red Head plug design:

1. The combination of a chambered plug having a sparking point thereon and elongated conducting member forming the second sparking point and projected through the chamber and extending adjacent to the sparking point and a tubular shell arranged in the chamber of the plug and spaced from the walls thereof and from the sides of said elongated member, forming the second sparking point.

2. The combination of a chambered plug having a sparking point thereon, and elongated conducting member projected through the chamber and extending adjacent to the sparking point, a tubular insulation shell arranged in the chamber of the plug and spaced from the walls thereof and from the sides of said elongated member forming a second sparking point, an insulating tube at the base of the insulating shell, a means for holding the said elongated conducting member snugly within the shell and tube.

4. An electric igniter, comprising an elongated member forming a sparking point, and insulating tube inclosing the major portion of the exposed part of said elongated member, and said shell having an open space around its outer side and between its inner side and the said elongated member.

5. The combination of a plug proper having a chamber therein and a reduced passage leading therefrom, an insulating tube placed in the said passage and having a shell-like extension projected into the chamber of the plug and spaced from the interior walls thereof, and a rod projected through the tube and through the shell, said rod being spaced from the inner walls of the shell.

6. The combination of a plug proper having a chamber therein and a reduced passage leading therefrom, an insulating tube placed in the said passage and having a shell-like extension projected into the chamber of the plug and spaced from the interior walls thereof, a rod projected through the tube and through the shell, said rod being spaced from the inner walls of the shell, and being formed with an enlargement engaging a shoulder at the outer end of the shell, and means for exerting an outward pressure on the rod to hold the parts snugly engaged.

Railways Killed 9,387 in 1 Year

A bulletin published by the Special Committee on Relations of Railway Operation to Legislation on railroad accidents states that according to a report of the Interstate Commerce Commis-

sion, 3,953 persons were killed on railways during the year ending June 30, 1912; of these 318 were passengers and 3,635 employees of the railroads. Besides 5,434 trespassers were killed, bringing the total of fatal railroad accidents to 9,387.

While among the persons killed there were undoubtedly a high percentage of vagrants—it is estimated that in the United States some 500,000 tramps wander around—a large number of the people killed were farmers, workers and other decent citizens—in short, people about which society cares.

Another important point brought out in the bulletin is the fact that out of 50,000 persons killed and 53,000 injured on American railroads for the years from 1901 to 1910, inclusively, 33,000 were less than 21 years old.

The death accidents, together with the general loss caused by hoboes, could be materially reduced by the railroads' policing their tracks, and the state governments assuming the conviction and maintenance of tramps. The Bulletin, the number of which is 46, contains many interesting details and may be obtained by applying to the committee mentioned above, whose address is 1972 Trasportation Building, Chicago, Ill.

Three Score Motor Deaths a Week

OMAHA, NEB., Feb. 21—According to Chief Dunn, of the police of this city, an average of from fifty to seventy-five accidents a week are due to the automobiles operating in various cities of the United States. During the 5 weeks ending January 23, according to the chief, 1,230 persons were injured and 208 killed, among these sixty-two in New York.

Chief Dunn expects to submit his statistics to the National Association of Police Chiefs, which is active in reducing automobile accidents.

Congressmen Oppose Oldfield Bill

WASHINGTON, D. C., Feb. 26—(*Special Telegram*)—Representative Bulkley, of Ohio, of the House Committee on Patents will submit his report tomorrow, Thursday, signed by one-half of the committee members, strongly opposing main features of the Oldfield bill amending the patent laws. Mr. Bulkley's report attacks establishment of compulsory license system, the extinction of the right of the owner of a patent to treat license violations as infringements and the amendment of Sherman anti-trust law as applied to those doing business under the protection of patents.

Smith Strike Is Short-Lived

MILWAUKEE, WIS., Feb. 24—After 3 days of negotiation, the strike of machine hands at the plant of the A. O. Smith Company was settled on Sunday, and on Monday morning every man who had walked out since the strike was called on February 19 was back at work. The retirement of a new foreman in the department in which the walk-out arose and whose personality was the sole reason for the trouble, resulted in a speedy settlement of the difficulty.

Changes to Hans Equipment Company

LA CROSSE, WIS., Feb. 24—The National Gauge & Register Company, La Crosse, Wis., has been reorganized, recapitalized and the corporate style changed to Hans Motor Equipment Company. A $50,000 factory building is now being erected at La Crosse to serve present needs and form the nucleus of a group of buildings to be established as needed. The Hans Equipment Company, manufacturing gasoline and oil gauges, crank case gauges, gasoline separators and strainers, air pressure pumps, oil sight-feed registers, gasoline and radiator tank filler caps and similar articles for automobiles, was organized at the National Gauge & Register Company by Edmund E. Hans at Minneapolis 2 years ago.

Monarch Motor Car Co. Incorporated in Detroit

L. G. Hupp Is President; Occupies Temporary Plant—Deliveries To Commence About May 1 Is Plan

Five-Passenger Touring Car of 30 Horsepower Will Be Built—Limbach Chief Engineer

DETROIT, MICH., Feb. 25—*Special Telegram*—The latest addition to Detroit's growing list of automobile manufacturers is the Monarch Motor Car Company, the articles of incorporation of which were filed with the Secretary of State on February 22. L. G. Hupp, who until recently was secretary and treasurer of the R-C-H Corporation, is president of the new concern. The other officers are understood to be well-known business men of this city, but announcement of the complete personnel of the organization is not yet made public. Mr. Hupp stated last night that a complete announcement of the plans of the company would be made on March 1 and that the temporary quarters are located on Scotten avenue in a plant formerly occupied by the Acme Electric Company, the latter concern having moved to another location. The chief engineer of the Monarch company is H. C. Limbach, who has been identified with both the engineering departments of the Studebaker Corporation and Cadillac Motor Car Company. Under his direction a five-passenger, 30-horsepower touring car will be built, to sell at about $1,000 fully equipped. According to present plans, deliveries to dealers will commence about May 1. A complete factory is to be built, which may possibly be ready for occupancy next fall, if all goes well. Mr. Hupp is a veteran manufacturer of the Motor Car Company and the R-C-H Corporation, although no longer connected with either of these enterprises. After leaving the Hupp Motor Car Company the Hupps, about 1 year ago, merged the Hupp Turner Machine Company, the Hupp Johnson Forge Company and the Hupp James Geyman Foundry Company, in all of which they were interested, and called the combination the R-C-H Corporation.

Aetna to Handle Motor Insurance

HARTFORD, CONN., Feb. 24—Morgan G. Bulkeley, president of the Aetna Insurance Company, appeared last week before the joint insurance committee to advocate amending the charter of his company for the writing of straight automobile policies, in addition to the liability and accident insurance for automobiles now handled by the liability department of his company. The Aetna company took up automobile insurance some time ago.

Twin City Cars Worth $12,400,000

MINNEAPOLIS, MINN., Feb. 24—Statistics prepared by H. A. Stuart, statistician for Minneapolis, show comparative automobile figures for the Twin City for final reports ending Dec. 3, 1912. Owned by private individuals and business concerns in Minneapolis there were 5,939 automobiles, or an average of one machine for every fifty-four persons. In St. Paul there were 2,251 automobiles, or an average of one to every 101 persons. At an average valuation of $1,500 for each machine the Minneapolis investment was $9,000,000 and the St. Paul figures $3,400,000. Allowing traveling space of 100 feet to each car, Mr. Stuart figures the Minneapolis machines would form a procession of 112 miles in length and the St. Paul cars of 42 miles. The city assessor's record showed 4,719 automobiles in Minneapolis May 1, 1912.

Oppose Increased Taxes

New York and New Jersey Organizations Active To Nullify Efforts of Anti-Motor Factions

Dealers Taking Up Legislation—Ohio Legislature Is Active—Pennsylvania To Buy Toll Bridges

THE New York State Automobile Association, through its legislative committee, of which Alvin A. Bender is chairman, is conducting a campaign against the increase of automobile registration fees advocated by Secretary of State Mitchell May of New York. The association maintains that the proposed increase is unjust, and while Empire State motorists are willing to submit to fair taxation, they are determined to oppose the proposed increase as outlined some time ago in THE AUTOMOBILE. If the proposed measure goes through a test case will be taken through the courts.

Incidentally, the Associated Automobile Clubs of New Jersey, the state association there, is opposing a similar increase of automobile fees. A bill has been brought in at the Trenton Legislature, advocating a wheel tax for all road vehicles, in order to offset the anti-automobile spirit now in evidence in Jersey politics. The present registration law of New Jersey has been taken through all state courts and been upheld on the reasoning that the state has the right to tax whoever and for whatever it chooses. A test case will be taken, in the near future, to the Federal courts to determine this matter.

Mitchell May, Secretary of State of New York, suggested that in order to effectively protect the public against irresponsible chauffeurs, that statutes relating to the examination and licensing of drivers be modified as follows: Every man applying for a chauffeur's license must file his application 10 days before he is examined, and his name and application is to be published conspicuously in the leading papers of the state so that parties in possession of such information as would cause the license not to be granted have an opporunity to turn that information over to the Secretary. Upon having passed his examination, the chauffeur is to be given a book, with his name, description and photograph, and space for immediate recording of every arrest for violation of the state motor law.

The Secretary has also suggested that no automobile should be taxed less than $10 a year, whereas now the minimum tax is $5; furthermore, that high-powered cars be charged more than the present maximum rate of $25. Truck licenses should be charged for from $5 to $50, depending on the weight of the vehicle. Secretary May claims that the income derived by the State of Massachusetts last year was almost twice that of New York State, and that if the same regulations were used in the Empire State as are in use in the Bay State $4,000,000 a year could be realized instead of $1,000,000, the total of the automobile taxes of 1912 for New York. Remembering that the $50,000,000 appropriation for state highways was largely due to the requirements of automobile traffic, Secretary May considers that automobilists should do their share in helping the state.

Unfortunately, it is easily foreseen, that this statute, even if passed, cannot perfectly solve the problem of the irresponsible chauffeur as it would in Germany or France. The reason is that in those countries there is a system of announcement by which the police authorities of the land are kept informed of the identity of every resident and citizen. Every man being required to have credentials must therefore prove his identity and cannot assume a false name as easily as here, if his purposes make such a course desirable.

The Automobile Dealers' Association, New York City, has arranged a meeting for February 26, 8 p. m., in the Hotel Woodward, in order to consider the present campaign of state officials to increase automobile taxation and to adopt resolutions on the proper course to be taken.

Live Automobile Legislation in Ohio

COLUMBUS, O., Feb. 24—The Ohio senate has passed three bills which were introduced by Senator Lloyd, which affect the driving of automobiles. The object of the bills is to protect automobile owners from joy riders. Penalties of 30 days to 6 months imprisonment and fines of $200 to $500 are provided for any person who refuses to render aid to any one after running them down with his motor car. A statute provides for the suspension of chauffeurs for drunkenness.

Workhouse sentences of 4 months and fines of from $100 to $500 are provided for any one convicted of taking an automobile without the consent of the owner. For removing any part of the necessary equipment of a car sentences of from 3 to 6 months and heavy fines are provided. For mutilating any part of a car heavy sentences and fines are provided.

A bill has been introduced in the Ohio General Assembly by Representative Tetlow making it a misdemeanor for any one to blow his horn and ring his bell in a loud and unnecessary manner in the residence districts of the cities.

A meeting of all of the automobile organizations of Ohio was held here February 19 for the purpose of taking part in pending legislation before the Ohio General Assembly. The meeting was held at the rooms of the Columbus Automobile Club where luncheon was served. After the meeting a legislative committee visited the governor who said he was for the bill now pending in the legislature basing the registration fees for automobiles on their horsepower. The governor said, however, that he was in favor of leaving the matter to a referendum vote of the automobile owners of the state. It was urged that the payment of registration fees to $30 or $35 on a car was double taxation and opposed to the spirit of the constitution.

Pennsylvania to Abolish Tolls

HARRISBURG, PA., Feb. 24—A number of bills were introduced in the Pennsylvania legislature this week. One was for the appropriating of $3,000,000 for aid of township road building and maintenance for 2 years. The senate has finally passed the bill turning over to the state highway department the $1,800,000 collected from automobile licenses for the past 2 years.

Senator Beidleman introduced a bill designed to rid the state of toll bridges. It authorizes the state to purchase by regular condemnation proceedings bridges over 1,000 feet in length erected over streams by corporations organized under general or special law for the use of which toll fees are charged. Senator Beidleman also presented another bill, authorizing the state highway department to erect wherever the need exists, free bridges in connection with the development of the state system of highways.

International Elects Directors

At the annual meeting of the Internal Motor Company, New York, held last week, the following directors were elected:

Edmund C. Converse, chairman, U. S. Steel Corporation; T. L. Chadbourne, Jr.; C. P. Coleman, William E. Corey, U. S. Steel Corporation; Otis H. Cutler, American Brake Shoe & Foundry Company; Harry W. Davis, Delaware Trust Company; Herbert H. Dean, Edward B. Smith & Company; William G. Dickerman, American Car & Foundry Company; Frederick H. Eaton, American Car & Foundry Company; W. T. Graham, Montgomery Hare, Arthur H. Lockett, Pomroy Brothers; Hunter Marston, Blair & Company; Ambrose Monell, International Nickel Company; Thomas E. Rush, Charles H. Sabin, Guaranty Trust Company; W. D. Sargent, Reading-Bayonne Steel Casting Company; Warren A. Wilbur, E. P. Wilbur Trust Company.

The officers elected after the directors are:

C. Phillip Coleman, president; William G. Dickerman, chairman of the executive committee; E. C. Converse, chairman of the board of directors; F. C. Richardson, treasurer; Vernon Munroe, secretary.

System Provokes Strike

Lockout in Renault Factory Due To Opposition of Workmen Against Stop-Watch Methods

Block Makes 5,000 Men Idle—Hudson Gives $100,000 for Transcontinental Road

PARIS, Feb. 15—Objecting to a system of timing factory operations with a view to higher efficiency, most of the men employed in the Renault automobile factory went on strike this week. The drawing office staff and sales department remained at work, and this so exasperated the strikers that they invaded the factory, drove out the men found there and caused considerable damage to machinery and fittings. At this turn of affairs Louis Renault gave the order for the entire factory to be closed, thus throwing 5,000 men idle. It is declared that thoroughly disgusted at the violence shown by his workpeople, Louis Renault has left Paris for Nice and is resolved not to return until his workpeople have adopted a more sensible attitude. Meanwhile, no work whatever is being done at the Renault factory, but building operations on the new factory now being erected by the river are continuing without interruption. The buildings are being guarded by police and gendarmes.

Knox Liabilities Are $1,286,409

SPRINGFIELD, MASS., Feb. 25—A schedule in bankruptcy was given out today by the receivers of the Knox Automobile Company, showing total liabilities aggregating $1,286,409, total assets, $1,380,386 and total unsecured liabilities, $1,261,907.

Hudson Gives $100,000 for Stone Road

DETROIT, MICH., Feb. 25—The Hudson Motor Car Company has agreed to donate $100,000 for the construction of the transcontinental stone road, the conditions being the same as in the case of the Packard and Willys donations.

E. V. A. A. Holds Monthly Meeting

The Electric Vehicle Association of America held its monthly meeting on February 25 at the United Engineering Societies Building, New York City. The principal speaker was James M. Skinner, whose subject was the Philadelphia thin plate battery, illustrated with lantern slides. An excellent description of the thin plates for battery uses was given. Extemporaneous talks were given by the different members of the association on subjects relating to the progress of the electric vehicles in the commercial field. Special interest was given the distribution of electric service stations throughout the country.

Schimpf to Visit Western A. A.

William Schimpf, chairman of the Contest board of the A. A. A., will leave New York for Los Angeles next week, in order to take up with the Western A. A. the situation of contest regulations in the West under the jurisdiction of the national body.

Automobile Dealers Hold Elections

At a meeting of the recently elected Board of Directors of the Automobile Dealers' Association, Inc., held in its rooms in the Hotel Woodward, on Thursday, February 20, 1913, Harry M. Bronner of the Edwards Motor Car Company was elected president, Arthur M. Day of the A. Elliott Ranney Company, vice-president, and Frank Eveland, of A. G. Spalding & Brothers, secretary and treasurer. The new board of directors of the association follows: Frank Eveland, N. J. Budlong, Arthur M. Day, Charles M. Brown, Harry M. Bronner, I. N. Uppercu, C. H. Larson, H. L. Stratton, Wm. C. Poertner, and W. Arthur Lesser. Charles A. Stewart continues as general manager.

Ths association appointed a special committee to look after the increasing legislative work. This committee consists of Arthur M. Day, Wm. C. Poertner and R. H. Johnston.

Two new members were elected: the Pope Motor Car Company to be represented by G. M. Stratton, and the Edwards Motor Car Company, to be represented by Harry M. Bronner.

Motor Truck Club Talks Shows

In a meeting held by the Motor Truck Club, New York City, on February 19, the members discussed the questions as to whether shows pay. Opinions were divided. Nevertheless, several members reported that the show time caused a more or less general disorganization of the factory and selling forces. The practice of giving away tickets to prospective customers, etc., also helps to make shows more expensive than they would be naturally. The consensus of opinion seemed to be, at any rate, that while truck shows had merits, undoubtedly their cost is high.

Joy Riding Not a Larceny

MILWAUKEE, WIS., Feb. 24—That joy-riding does not constitute larceny or theft of a motor car and theft insurance does not cover the damages arising from joy-riding, was the decision of Judge Cordes in Civil Court at Milwaukee in the case of William K. Murphy against the Hartford Fire Insurance Company to recover $400 damages.

Mr. Murphy gave his car into the hands of one George Murray to be taken to Beaver Dam, Wis., for overhauling. While the car was in Beaver Dam, it was alleged that two of Murray's friends took the car one evening and after a wild joy-ride damaged the machine $400 worth and abandoned it at the roadside. Mr. Murphy carried theft insurance, as well as fire protection, in the Hartford, and demanded restitution in the amount of $400. The insurance company denied his request, on the ground that the action of the joy riders does not constitute theft and that the car had not been stolen within the intent of the law.

Johnson Enforcing Anti-Smoking Ordinance

Fire Commissioner Johnson of New York City has taken active steps to enforce the rule which forbids smoking in garages. This rule, which had been issued some time ago, has hardly been enforced heretofore; but, as the commissioner's investigations show that during the first two weeks of February five garage fires took place in New York.

Chauffeurs Against Law Breakers

The Gasoline Engineers Protective Association of New York City, which is a chauffeurs' organization, has decided to take whatever steps tend to reduce the public evil produced by irresponsible chauffeurs. A letter published by the organization a few days ago contains the following passages.

"The object of this association is to eliminate joy riding and drunkenness and uncalled-for violation of city ordinances, to oppose and try to have repealed unjust laws, try and prevent unjust newspaper criticisms, to put the profession on a high plane, so that a chauffeur will not be discriminated against because of his calling. Any chauffeur is eligible to membership who can furnish bonafide references covering a period of not less than 2 years and can fill the requirements as prescribed by our constitution and by-laws in regard to character. Character is the most essential requisite in gaining admission to this order."

Brooklyn Show Opens With 300 Automobiles

Small Shows Throughout the Country Now On—Some of the Cities Have Their First Shows

Fine Attendances and Good Sales Are Reports From the Different Exhibitions

WITH more than 300 automobiles arranged on the main floor of the Twenty-Third Regiment Armory, the Third Annual Brooklyn Automobile Show opened on February 22, in the evening. This show, which will fill the armory for one week, is a local show in a way inasmuch as the Brooklyn Motor Vehicle Dealers Association consists of automobile dealers handling motor cars in the Long Island territory, including in several cases part of Connecticut and New Jersey. The magnitude of the show, however, gives it greater significance than the ordinary local show. The armory, which is fully as large if not larger than Madison Square Garden, is entirely filled up by the pleasure cars and trucks which are arranged in two blocks extending from one end of the armory to the other, and which are separated from each other and from the wall exhibits by two aisles. A number of automobiles are also exhibited in the entrance hall and several along the further end of the building. Along the length walls of the armory accessories and other minor exhibits have found space.

The attendance to the show exceeds all former records, the opening night saw 12,000 visitors and the following days approximately 7,000 each.

As before the decorations are simple but tasteful, consisting of white fabric arranged under the roof and bunting mounted on it in several places to heighten the effect of the white. The armory, this year, was almost too small to house the exhibits which were arranged quite closely, in fact, much more so than last year. It was on this account that several of the Brooklyn dealers did not take space at the show but had their own exhibitions at their stores along automobile row, one block from the armory, where the stores were attractively decorated.

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Davenport Attendance Was 6,000

DAVENPORT, IA., Feb. 23—With a total attendance of 6,000 the 5-day exhibit of the fourth annual Tri-City Automobile Show came to a close tonight. There were fifty-nine cars in all, placed by twenty-five dealers of Davenport, Rock Island and Moline. Electrics were one of the most popular of the exhibits this year, five makes being represented. High and medium-priced cars appeared to attract the most attention and it was in these classes that the most sales were made. There was a good line of accessories on exhibit. This year every available square foot of exhibit space was taken up and several dealers were unable to secure show room. The booths were cut down in size to allow as many exhibits as possible. Owing to lack of room no trucks or factory exhibits were allowed. Dealers reported that the largest percentage of buyers were farmers or residents of small towns adjoining the tri-cities.

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Syracuse Show Is Biggest Ever

SYRACUSE, N. Y., Feb. 25—(*Special Telegram*)—The largest automobile show in Syracuse history was opened tonight, at the Armory, by Mayor Schoeneck, with the record-breaking attendance of 9,000. There are forty-two pleasure car exhibits representing fifty-five makes and ninety-five machines. There are eighteen exhibitors of trucks with twenty-two makes and seventy machines. There are also thirty-two exhibits of accessories and aeroplanes. Every inch of exhibition space is utilized. For the first time since the annual shows were started here there is space taken by every Syracuse dealer. The prospect for a successful selling campaign is excellent; several sales were made tonight and large numbers of promising prospects were reported. A feature is the large number of visitors from suburban districts who intend buying cars. The sales of trucks bid fair to break all previous records especially for light delivery vehicles. In the pleasure vehicles the demand seems largely for medium-priced cars. Th show lasts the rest of the week. Harry T. Gardner is manager.

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RICHMOND, VA., Feb. 24—The first automobile show held in the Horseshow building this week proved a success and many cars were disposed of. The display embraced thirty-one exhibitors who showed sixty-eight pleasure cars, and seven trucks and wagons. The cost of the exhibits was estimated at $750,000. The exhibitors used 14,000 square feet, and 70 per cent. of the cars exhibited had electric starting and lighting systems.

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Baltimore Show Seen by 35,000

BALTIMORE, IND., Feb. 24—When the doors of the Fifth Regiment Armory closed Saturday night it was found that in round numbers 35,000 persons had paid for admission to see the exhibition during the five nights.

There were forty-three exhibitors at the show and more than 200 cars and trucks on the floor of the Armory. All of the dealers report a large number of sales but the record seems to have been carried off by the Ford Automobile Company, which reports the sale of 143 cars.

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Many Sales at New Orleans Show

NEW ORLEANS, LA., Feb. 24—Attendance at the automobile show, which closed yesterday, was 20,000. This is somewhat less than on previous years, but is accounted for by the fact that previous shows have been held during the Mardi Gras season, when many visitors were attracted only by idle curiosity. This year, with the show being held during Lent, it is certain that the greater part of those who paid admission had some active interest in motoring. Actual sales made during the show were larger than during any of the previous shows. Another feature that was brought out plainly during the exhibition was the interest taken by residents of the smaller towns and country districts.

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Seattle's First Show Success

The Seattle, Wash., show has been declared a thorough success. There was an average daily attendance of 4,500 to see the twenty-one different makes. During the week there were more than 100 actual sales made from the floor of the Armory. Among the distinctive exhibits was the Oakland, on a platform elevated just enough to give it prominence.

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HARTFORD, CONN., Feb. 22—What promises to be the best automobile show ever held in New Haven opened this evening at the Second Regiment Armory. Attendance was good. A total of 125 pleasure cars and trucks are displayed. Dealers assert that they are doing a good business and all indications point to a very successful week.

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During the first week of coming September the forty-first annual convention of the International Association of Fire Engineers will be held. A most complete exhibition of fire-fighting equipment is planned, and Commissioner Joseph Johnson, of the New York Fire Department, is the chairman of the convention committee.

French Grand Prix To Start on July 12

Remy Electric Company Offers Remy Brassard and Trophy for Winner in 200-Mile Race at Indianapolis

N. H. Van Sicklen To Be Connected with the Savannah Automobile Club in Official Capacity at Races

PARIS, Feb. 15—It has now been definitely decided that the French Grand Prix race shall be a 2-day event on Saturday, July 12, and Sunday, July 13. The first day shall be devoted to the 560-mile big-car race on a fuel consumption basis equaling 14.1 miles to the gallon, and for which eighteen cars are now regularly entered. On the second day there will be two races, one in the morning being for motorcycles of 350 and 500 cc. cylinder capacity, and one in the afternoon for cyclecars and motorcycles having a sidecar attached.

As a result of a visit to the course, it has been decided to abandon the proposed scientifically banked cross-road. The two main legs of the course run almost parallel and only 120 yards apart for a distance of over a mile before they unite at a point known as La Fourche. Instead of taking the cars round the existing hairpin, it was proposed to build a cross-road a quarter of a mile from the present turn, with such a banking that high speeds could be maintained. A close examination shows that, owing to the difference of level of the two roads to be united, this task would be both difficult and costly. In consequence, an ordinary cross-road with the angles rounded off and a slight amount of banking at the inlet and the outlet will be built. This road will have a cement surface. The original plan of building the grandstands around this cross-road will be adhered to, with the pits on the inside of the bend. Work has already begun on the course and it is expected that it will be in fine condition by July.

Minneapolis After A. A. A. Run

MINNEAPOLIS, MINN., Feb. 24—The trustees of the Automobile Club of Minneapolis met Tuesday noon to consider ways and means to obtain a guarantee fund with which to back an invitation to be extended by the Minneapolis Civic and Commerce Association for the 1913 national reliability tour of the A. A. A. to start from Minneapolis and run west, preferably over the northern transcontinental route laid out last summer by A. L. Westgard as far as Glacier. It is understood that the Great Northern road will operate one or two complete hotel trains to run along the route for three meals a day and night lodging if this route is followed. This route is similar to that of the 1911 tour of the Minnesota State Automobile Association as far as Helena. The proposed A. A. A. route would turn from Havre and run westward 180 miles. Satisfactory return freight rates on the automobiles is to be made and entertainment at the park which will make the occasion long to be remembered is promised if the proposed schedule is carried out. Dr. C. E. Dutton is chairman of the committee to arrange for a tour. Asa Paine, fifth vice president of the A. A. A., is vice chairman and E. C. Hillweg is secretary.

Van Sicklen to Work for Savannah Races

SAVANNAH, GA., Feb. 24—N. H. Van Sicklen, president of the Chicago Motor Club and of the Chicago Automobile Trade Association, will be connected with the Savannah Automobile Club in an official capacity when the Grand Prize and Vanderbilt Cup races are run over the Chatham County course during Thanksgiving week, according to an announcement authorized by Harvey Granger, president of the Savannah Automobile Club.

President Granger has written to the Chatham County commissioners requesting that they give their aid from this time forward to perfecting the automobile course, as they have done in the past. There is no doubt about the desired co-operation being granted. The commissioners have already announced to this effect. The course will be shortened to 12 miles, and will be made as nearly perfect as possible.

As soon as the accurate measurements of the course are received, the question of the piston displacement of the cars to be entered in the Vanderbilt Cup race will be considered. It is hoped to change this displacement from 600 to 450. In order to do this it will be necessary to secure the consent of William K. Vanderbilt. As soon as Mr. Vanderbilt is heard from the entry blanks for the races will be distributed. While the reduction in piston displacement would bar out of the Vanderbilt Cup race one or two high-powered cars, it would permit them to enter the Grand Prize race and would make the field in the Vanderbilt much greater than under the present rules.

Only one curve of the several that will be a part of the completed course will have to be banked. The other turns were banked for the previous races. The whole committee on course has met and determined upon the report of the sub-committee, which recommended a 12-mile course.

Remy Brassard for Memorial Day

INDIANAPOIS, IND., Feb. 24—The Remy Electric Company, Anderson, Ind., has consented to offer the Remy Brassard and Trophy as the prize to be awarded the car and driver which first completes 200 miles in the next 500-mile race on the Indianapolis Motor Speedway, on Memorial Day.

INDIANAPOLIS, IND.—Frank P. Fox, of the Frank P. Fox Company, has formally entered a Fox Special in the 500-mile race, nominating Howard Wilcox as driver. It will have a four-cylinder motor, 4.75 inches bore by 5.5 inches stroke, with a piston displacement of 389.9 cubic inches.

It is announced that a special prize will be given to the driver leading at 100 miles. This will be the Red Head trophy, offered by Emil Grossman, manufacturer of Red Head spark plugs. If the driver uses Red Head spark plugs he will receive from Grossman $10 a week for 50 consecutive weeks, in addition to the trophy.

Washington 300-Mile Truck Run

WASHINGTON, D. C., Feb. 24—A 4-days' motor truck reliability run will be held May 5-8 under the auspices of the *Washington Post*. The route, which will cover about 300 miles, has not been definitely determined, but will be over a section of the country which will give a diversity to the test. The classification will run from the smallest delivery wagon to the heaviest trucks. It is intended to interest government officials in the test run and to this end invitations have been extended to various officials to participate. Already a number of acceptances have been received, particularly from members of the general supply committee, which frames all the specifications for motor trucks and every other commodity purchased by the government. The run will be conducted under the rules of the A. A. A.

The initial 1913 run of the L. I. A. C. was held on February 22, from the home of the club to Finlayson's Hotel, Rockville Center. There were thirteen cars in the run, and fifty members participated. After returning to town in the evening the party started for the automobile show.

The Long Island Automobile Club plans a large number of contests for the coming season, and so far nineteen trophies have been received from various donors. The first competition will be held on April 5 and the second on April 20.

Digest of the Leading Foreign Journals

Silent Cam and Gear Action and Simple Oiling in Hotchkiss Motors—Cost of Tires and Fuel for Omnibuses—The Fuel Feed in Automobile Diesel Motors as Proposed by Malms—Improved Reciprocating Piston Pump for Fire Engines

FEATURES of Hotchkiss Motor—While the 18-horsepower Hotchkiss car, made by the arms company of the same name, is of very conservative design in the matter of following popular tendencies, some exclusive features are found in it. They relate mostly to the motor, though it is also noted that a special differential gear is employed to equalize the action of the wheel brakes. The motor has four cylinders, 95 by 130 millimeters, cast in one piece but with each cylinder completely surrounded by the cooling water. Silence of the valve mechanism is effected by the construction shown in Fig. 1. The tappet rods are in two tubular pieces, P and M, held apart and in continuous contact with the cam K below and the valve stem S above by means of the coil spring R, and the tubular space is nearly full of oil. When the cam K raises the roller G the two parts of the tubular tappet thus come together inside of the guide T. The construction permits an easy adjustment of valve lift by means of the thin washers L. The customary valve housing is also employed.

The camshaft is driven by mitre gear pinions from the crankshaft and drives in turn the pump and the magneto through similar pinions. To avoid vibration in this drive, the mitre gear wheel on the camshaft has its crown mounted upon the spider with a capacity for a slight elastic yield between these two parts, the mounting being effected by means of four small leaf springs secured radially to lugs on the spider and lugs on the crown.

The principle of the motor lubrication is that a force pump drives an excess of oil through a very large bore extending throughout the crankshaft with relatively very small lateral bores to the bearing surfaces, this arrangement having been found sufficient for obviating all chance of the first bearings in the circuit robbing the last ones of their quota of the oil. The pump is of the oscillating type, the piston being actuated by an eccentric on the flywheel-end of the crankshaft, immediately inside of the end-bearing. Its construction is shown in Fig. 2. The pump cylinder is pivoted by means of shaft G to a plate which is secured by eight bolts to the outside of the bottom of the crankcasing covering a hole in the latter, and the whole mechanism, excepting the plunger piston which remains suspended from the crankshaft, can be pulled out and cleaned if necessary after undoing these bolts. A sheet metal bell O is secured to the cylinder body and contains a filter P through which the oil must pass to reach the entrance ports H which are uncovered when the plunger D is raised. When the plunger goes down and has passed these ports, the oil is forced up through the bore I in the plunger, having no other exit, and at a certain point in the stroke passes into canals J and K in the eccentric and to the central bore L in the crankshaft. From the last crankshaft bearing a column of oil is piped to a pressure gauge on the dashboard. The excess oil forced out of the crankshaft bearings and the connecting-rod bearings serves for the splash lubrication of the cylinder walls, piston pin and camshaft. A safety valve Q in the pump barrel limits the pressures in this body. The amount of oil in the crankcase is ascertained by the old means of high-level and low-level trial cocks.—From *La Vie Automobile*, February 8.

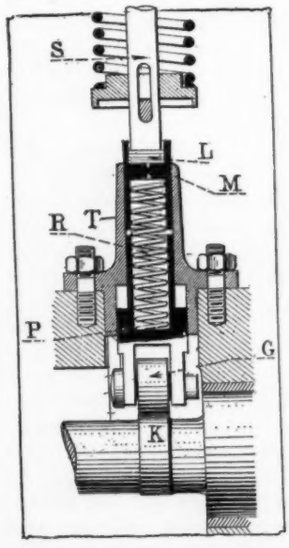

Fig. 1—Hotchkiss valve action

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Spring Suspension—It is mentioned as a fact verified by experience that the front springs of an automobile affect the comfort of those sitting over the rear springs. For example, in a certain car an intolerable galloping motion developed over the rear axle whenever the vehicle was driven at medium or high speed over a lumpy road, and this trouble was remedied completely by adding two leaves to the front springs, stiffening them.—From *La Pratique Automobile*, January 10.

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TIRE Cost Down, Fuel Cost Up—When the General Omnibus Company of Paris received its franchise, the estimate which was furnished the municipal council called for a little more than 1 franc of receipts and expenditures for one omnibus per kilometer, everything included. The results of operation fell a little below this estimate, and the expense per vehicle-kilometer is in fact at the present time slightly below 1 franc. Included in this estimate 0.20 franc had been allowed for tires and 0.12 franc for the fuel. In the actual operation these figures have now been reversed. The fuel cost exceeds 0.15 franc at a market price of 34 francs for 100 kilograms of benzol, a price which will soon be left far behind. [In Germany the consolidated benzol manufacturers have, on the other hand, agreed to keep the price of benzol at what it is now for a series of years.—Ed.] In contrast herewith the cost of tire maintenance, including first cost and renewals, has gradually gone down to 0.10 franc and should, it seems, not exceed 0.09 in the future. This result is greatly to the credit of the tire makers, who in two or three years have succeeded in raising the durability of the tires from an average of 12,500 kilometers of service, as it was during the first years of omnibus traffic, to 40,000 or 45,000 kilometers. Certain Bergougnan tires have even lasted for 68,000 kilometers. But it is to be noted that the first cost of these more durable tires is also considerably higher than that of the tires used at first. [The advancement in the economical results is perhaps, to a great extent, to be ascribed to a better understanding in suiting the tire dimensions to the work demanded of them.—Ed.] It is plain what a deficit the General Omnibus Company would have had to face if the tire makers had not come to its rescue. But the last word has not yet been

said. The fuel prices continue to rise, and the economical difficulties are going to set in again without any hope this time of being able to offset the increasing fuel prices by a corresponding reduction in the tire maintenance cost.—From *Poids Lourd*, January 24.

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Error in Chain Length Formula.—In the formula given in the issue of January 30 for calculating the length of a silent camshaft chain from the distance between crankshaft and camshaft, or vice versa, read π^2 (pi square) instead of the meaningless η^2 (eta square).

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THE Adapting of Diesel Motors to Automobiles—An account was given in THE AUTOMOBILE of Jan. 16 and 23 of the difficulties which are met when an attempt is made to apply the Diesel principle and Diesel motor fuels to such relatively small and light high-speed motors as are required for automobile purposes and of the mechanical ways and means proposed by Engineer Otto Malms of Mannheim, Germany, for overcoming these difficulties—all of this being taken from an article in a German automobile journal. A doubt was expressed as to the complete efficacy of the fuel feed recommended by him and in consequence hereof a letter has now been received from Mr. Malms showing that the doubt was based on an incomplete understanding of his proposition. As the subject matter is of the deepest interest for the development of the automobile and its allied industries and for a final settlement of the mooted fuel and fuel-price question which is convulsing Europe and agitating America, the letter is translated herewith, while the reader is referred to the previous articles with regard to the details of the proposed construction. Mr. Malms writes in substance:

Editor THE AUTOMOBILE—I have read with interest your account of my treatise on "automobile Diesel motors." Your exposition of the subject shows that you have throughout understood everything as I meant to convey it, and I thank you for the pains you have taken in rendering it in English. Only with regard to the control of the fuel valves leading to the fuel nozzles has a small and easily pardonable error slipped in. If you read once more the passages in my original article which deal with this point you will find that in describing the fuel pump I said that a fuel valve arrangement must here be employed similar to that shown in Fig. 1 [Fig. 4 in THE AUTOMOBILE, Jan. 16], but that the valves must be operated with an invariable stroke and invariable timing, also that the period during which the valves remain open must be so extended that the four periods of the four valves in a four-cylinder motor will overlap, to the effect of producing a continuous fuel feed from the valves, corresponding to the continuous fuel supply from the pump. In other words, the fuel valve of each cylinder must not only remain open during the entire suction stroke, but also during a portion of either the compression stroke or the exhaust stroke.

As the pump at any given cam adjustment always delivers the same amount of fuel for each revolution and the fuel valves to the nozzles have unvarying periods of opening and closing, the amount of fuel fed to each of the cylinders MUST also remain invariable. In order to regulate this amount, the oblique cams are displaced and the amount of fuel supplied by the pump in a time unit is thereby increased or reduced. The same effect can be obtained by changing the gear ratio between the motor shaft and the pump shaft, for example by means of a friction gear. No difficulties can arise by this system, and it looks as if the described arrangement might be the only practical one for feeding strictly measured quantities of liquid fuel in the very small doses required.

I must add that a patent for this fuel feeding system has been applied for.

Thanking you in advance for correcting the little error by means of these explanatory remarks, I remain (*Signature.*)

The correction asked for by Mr. Malms is cheerfully conceded, although the necessity for it is due mainly to the ambiguous explanation of the feature referred to given by himself in his original treatise. What he said was, literally translated, as follows: "The distribution to the four nozzles of a four-cylinder motor is also in this case effected in the previously described manner as illustrated in Fig. 1 [Fig. 4 in THE AUTOMOBILE, Jan. 16] by means of a mechanically controlled fuel valve with equal stroke and equal period of opening for each nozzle, and with the open-periods of the valves somewhat overlapping."

This doubtful passage has now been explained by its author, and the explanation is so much more interesting as it shows that the proposed system is applicable only to motors having a sufficient number of cylinders to admit of keeping one or another of the fuel valves open all the time, and that the system therefore presumably is still better applicable to a six-cylinder motor than to a four.

With this explanation a highly important feature in the construction proposed by Mr. Malms remains undisclosed, however. The mechanical means by which the opening and closing of the fuel valves are synchronized properly with the cycle of the motor, whether the motor is running fast or slowly under variations of its load, and yet so adjusted that the open-period does not vary, are not at all described. And yet, a fuel valve motion of this nature can scarcely be characterized as obviously simple. Perhaps it might be effected by placing the needle of the fuel valve—each of them—under the influence of two springs, one stronger than the other, and having the opening of the valve effected by releasing the stronger spring of the two, so as to push back the weaker spring at a certain speed, determined by the difference in the springs, and raising the needle from its seat during the time required for this differential spring action.

But Mr. Malms does not say that this or any other definite method is the one which he proposes, and his proposition therefore remains mechanically incomplete at a very important feature, with regard to which, it may be inferred, information is for the present withheld for reasons connected with the patent protection which he desires to obtain. Assuming, on the other hand, that this important feature has in some manner been covered by the inventor, although it is not disclosed, and that no serious objections exist against feeding the fuel into the nozzles of the motor cylinders during periods bearing a very different relation to the strokes of the motor than that which is

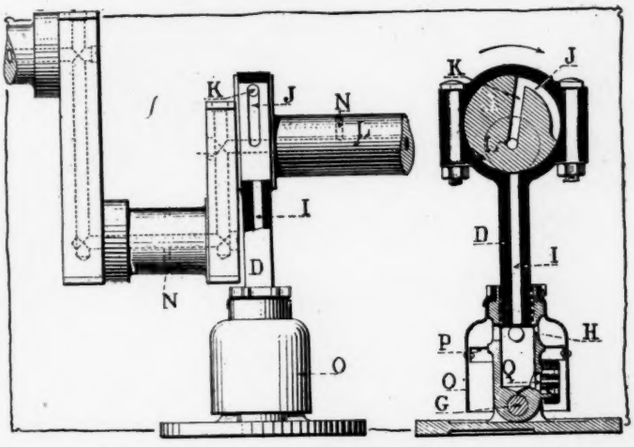

Fig. 2—Oil pump in crankcase of Hotchkiss 18-hp motor

observed in ordinary Diesel motors, the general mechanical scheme set forth by Mr. Malms must be admitted to be not only interesting and suggestive but of the greatest practical importance. But its value hinges perhaps on the undisclosed features.

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IMPROVED Piston Pump for Automobile Fire Engines—The manufacture of fire engines is knocking at the doors of the automobile industry, claiming admission as a branch of production in which great progress may be effected, both mechanically and economically, by the same methods which have improved and cheapened automobiles. Closely studied this line promises perhaps better profits for a while than the manufacture of heavy trucks, since the competition in the fire engine line is with larger and heavier engines of greater complication and higher cost while in the truck line it is with a mode of transportation, by horses, usually calling for a smaller initial investment.

While it is the simple centrifugal pump driven from the automobile transportation motor which is responsible for moving fire engines into the automobile domain, it is noticed that the advantages of these pumps are now reacting to bring about improvements in other types of pumps, so that those, too, may be mounted upon ordinary light truck chassis or heavy automobile

chassis with very few changes in details of construction. In this respect the Drouville four-cylinder piston pump, made at Nancy, France, must engage the attention of those interested in the movement. Many of the technical shortcomings of old-style piston pumps, as these have been used in fire engines drawn by horses or propelled by storage batteries, have been overcome or reduced in this construction. It discharges a stream of water with almost the same regularity as a rotary pump, moving the water continuously in the same direction. The construction is shown in two sectional views in Figs. 3 and 4, the latter being a section on the line XY of Fig. 4.

The four single-acting cylinders are placed in the form of a cross and are secured to a double bronze drum forming two concentric annular chambers in the outer one of which, *b*, the water is received from the supply hose attached at B, while the inner one, *c*, is the pressure chamber from which the streams are sent forth through hose attachments at CCC. The pistons F have two opposite leather facings securing water-tightness in both directions of movement. The bottoms of the cylinders are closed by the suction and pressure valves L and M, which are thus of maximum dimensions; they are made of molded rubber stout enough to resist the pressures. Opposite to the end of each cylinder and opening into the annular chamber *b*, a screening O is secured by gudgeons and screwbolts, and a bolt running through the axis of this cylindrical screening holds against the inner end of its frame a perforated metal plate which serves as a seat for the rubber valves.

The rods of each pair of opposed pistons are rigidly assembled and journaled upon a square frame mounted by means of two ball bearings on the crankpin of a central shaft which receives its motion from the motor shaft or the gear-box of the vehicle. The two middle ball bearings correspond to one pair of pistons and the two outer ones to the other pair, and the piston rods of the latter pair are forked so as to allow those of the other pair to pass them in the rotary movement of the crankshaft by which the pistons are actuated.

As the reciprocating movements of the four pistons take place successively and in the order of rotation, the current of water produced in the annular pressure chamber *c* always follows the same direction and is practically continuous. Nevertheless an air bottle, not shown in the illustration, is connected with the pressure chamber at the top of the drum and serves the more complete equalization of the water pressure in the fire hose, as in other less well balanced fire engine pumps of the reciprocating piston type. Usually provisions are made, as indicated in the illustration, for attaching three hose to each pump and the whole mechanism is mounted at the rear of the automobile frame with the drum in a vertical position and the hose nipples extending directly to the rear at the points marked C. A bypass valve, regulated by hand admits of ready reduction of pressures, so that the pump and the motor may continue to operate even if the hose nozzles are frozen up or otherwise clogged, but the safety offered in this respect is of course not quite equal to that which the centrifugal pump automatically affords. Still, the worst that can happen if hose does not burst and the Drouville pump is sufficiently robust to withstand the pressures which may arise when the motor is coupled to the low gear and the motor is running full tilt, is the stopping of the automobile motor.

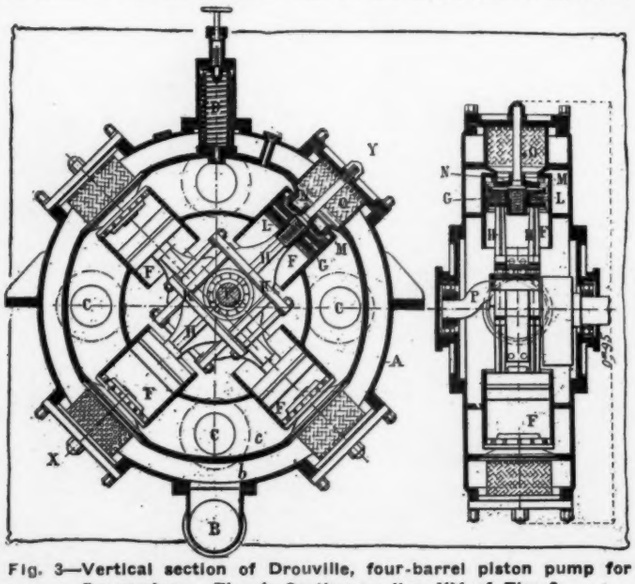

Fig. 3—Vertical section of Drouville, four-barrel piston pump for fire engines. Fig. 4—Section on line XY of Fig. 3

In comparison with other fire pumps of the reciprocating piston type, the Drouville construction presents improvements which are best realized by a summary of the requirements. There should be as little dead space as possible; the valves should be light and should have a minimum overlap on their seats, so as to reduce the difference between the resisting-pressure which acts on their largest diameter and the working-pressure which acts on the area of the aperture in the valve seat. These requirements apply to all water pumps depending on suction. For fire engine purposes additional ones are to be considered. A short stroke is bad, because it multiples the shocks which always accompany the reversal of the piston movement; and the average rotary speed should preferably be small to reduce the irregularity resulting from the transformation of a rotary into a straight-line movement. Finally, it is necessary for efficiency to avoid all narrow water passages, as the strangulation of the fluid involves a considerable loss of power which makes itself felt in a reduction of the working-pressure and a shorter reach of the stream.

Usually these requirements are very imperfectly met in fire engine pumps. In the Drouville construction, on the other hand, dead space is greatly reduced; the large valves minimize strangulation; their small weight, due to the material of which they are made, quickens opening and closing; the rotary course of the water in the annular channels counteracts eddies and shocks; and these good points make it practicable to use relatively small cylinders with a short stroke without experiencing the usual inconveniences from these technical shortcomings—which it is difficult to overcome without making the whole machine too cumbersome and heavy.

In practice the current type of this fire engine pump has cylinders of 140 millimeters bore and 80 millimeters stroke, and the speed corresponds to 300 to 400 revolutions per minute of the pump shaft, so that it may be operated with a gear reduction from a normal automobile motor of moderate power. In these dimensions the pump can handle 90 to 120 cubic meters of water per hour when used as a mere excavating pump and registers a manometer pressure of 80 meters of water (10 atmospheres). The depth from which it can draw the water can reach 8 1-2 meters [the theoretical maximum for a suction pump being 10 meters, corresponding to one atmospheric pressure], and it can throw a stream 50 to 60 meters horizontally and 35 to 40 meters vertically [presumably with the most favorable diameters of hose and hose nozzle, these dimensions not being specified in the account].—From *Le Génie Civil*, February 1.

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INNER Tubes Improved by Glycerine.—The French firm making "Sparklets" tubes containing highly compressed carbonic acid gas to be used for the inflation of automobile tires now offers a small special can full of "Glysoto"—which is a liquid made from glycerine as a base—to be used once a year together with the "Sparklets" tube for the purpose of preventing the carbonic gas from escaping by exosmosis through the rubber wall of the inner tire tube. It has been found that this gas escapes more rapidly than common air at the pressures required for tires and that consequently the tire goes soft in quick order unless this new precaution is taken, and it has been found, on the other hand, that glycerine, of all viscous liquids, is one which does not injure rubber but on the contrary improves it and preserves it.—From *Omnia*, February 1.

Efficiency and Its Ends

Principles Applied Must Eliminate Waste of Energy Growing Out of Many Reasons

Co-operation of All Parties Involved in a Business an Essential of Success

THERE is a widely prevalent idea that scientific management as applied to garages, repair shops, stock rooms and so forth consists merely in the introduction of recording systems, principally composed of a number of blanks; on each of which as many details as possible are recorded. Take, for instance, the example of a repair shop; there, some forms are used to note the exact time spent by each man in the shop and on what individual jobs and other forms for recording the parts and tools used on the jobs, etc. This information is, of course, important; but frequently is taken for the end instead of the means to a higher end. This higher end is the constantly increased approximation of ideal establishment efficiency.

The word efficiency, which is now in the mouths of everybody, has been used and abused so much of late, that it should be worth while to make clear and definite the idea for which it stands. Making use of an analogy, it appears at once that efficiency in industrial and commercial operations means the ratio between the individual energy spent by a worker or a set of workers, independent of what their standing is, and the useful work accomplished. It is only the useful work which interests us directly, the remaining quantity of the individual effort spent being negative from an economic viewpoint. The ratio is therefore, akin to that proportion between latent heat of combustion of a fuel and the useful work delivered at the point where it is finally used, that is, crankshaft or roadbed.

The question of efficiency, looking on it from the point of vantage of the Business Man, resolves itself, then, into that of obtaining a maximum of useful work from a fixed quantity of effort exerted by a worker. Let us say that the energy spent by an average man in his daily work corresponds to the energy contained in .6 pound of carbon, or 8,400 British thermal units. This energy is spent during, say, 8 hours. The rate of energy expenditure may vary, but as a rule is fairly such as to be representable by a straight line, excepting a maximum at the start in the morning and a depression about noon. The average energy expense is therefore 1,050 British thermal units an hour. This expenditure is identical with the worker's effort, namely, action, accompanied by consciousness of a variable nature on the part of the worker. **The effort, however, which results in the expenditure of 1,050 British thermal units an hour is fixed. The variable nature of individual consciousness depends largely on the rate of energy expenditure, the nature of the work and the individual constitution—including in this term all the personal qualities—of the worker.** Consciousness includes, of course, all agreeable and disagreeable sensations, being both of a physical (bodily) and mental nature.

Exact Study of Workers Essential

Following is a truth, carrying conviction to every student of man and his work: The most advantageous state of individual consciousness, that is, to the individual himself, during work, obtains when the work is that best suited to a person's constitution—in the widest sense of the word—done at the rate best suited to his constitution; which latter is therefore the fundamental factor determining the result of a man's work. In other words, a man working—not loafing—at the rate and at the work which best suit his natural individuality will, under these conditions, turn out work of the highest efficiency within his possibilities. That is to say, under these conditions, the greatest possible quantity of the energy spent by him will be translated into useful work.

The problem which the scientific manager faces consists therefore in the finding of the best conditions under which the men directed by him should operate. A number of general experiences in this regard are, of course, widely recognized. Everyone knows that writing, typewriting and kindred work is easier and better done seated before a suitably built desk than standing. Again, the height of the worker and the desk introduce a number of possibilities determining the various results. Likewise, everyone knows that the average individual works easier in the early morning than in the afternoon or late evening, provided he had a normal amount of sleep before starting work, and for this reason the hardest work should always be done in the morning, when the worker's mind and body are in best condition to execute their tasks. It is further known that certain physical work such as marching is made much easier than otherwise by following a rhythm played or sung. Likewise reading, writing and calculating are made difficult by exactly the same expedients. But who knows exactly what and how much food is best taken for breakfast, lunch and dinner, to develop a person of greatest working efficiency? Or in which cases a man's efficiency is increased or decreased, by stimulating him in a friendly, severe or contemptuous way? Dozens of similar questions must suggest themselves to the man fit to be a scientific manager.

Great Managers Need Big Brains

Managers there are a-plenty, but few are scientific. Science, that is to say, knowledge, is the difference between the modern and efficient manager and the old-fashioned and unefficient one. To be a great manager, it is not only necessary to know how to give orders, but also what orders to give, to whom and when. The great, scientific manager must not only understand the requirements of business in general and his specific business in particular, but he must also have a fundamental understanding of economics, psychology, physiology and anatomy; not too much and not too little; he must be a specialist and a man of widely varied knowledge at the same time; and he must have the ability of forming original trains of thought and of understanding, criticizing and improving upon the thoughts of others. It is because of these manifold requirements, that the number of scientific managers of magnitude is small today; as in every other field of endeavor, many are called but few are chosen.

Truly scientific management is distinct from all other activities formerly known, in one way. As indicated in the above remarks, it recognizes that maximum industrial success and individual happiness are capable of being harmonized. Thus it makes possible the solution of the greatest problem which the world has known for the past forty centuries.

Coming back to the original subject of record systems and their importance, it stands to reason that unexact records are of no more value than none. It must, therefore, be impressed upon the men in charge of the system, that the exactness and truth of all records is of first importance. They must not only be convinced of this but also of the fact that the records benefit them as well as the business. They must see that their interests and those of the business are parallel. And there is no way of convincing them of this but by the truth. If scientific management is made a means for increased business and profit only, if it is thus fashioned into a hollow mockery of a splendid idea, it must not only accentuate industrial difficulties, but result in less business returns than could be obtained if the idea were taken up honestly.

Business, the sum total of great activity of today, needs men, men of the biggest caliber. Men of great conceptions, great power and, above all, men of immense courage. It takes less courage to accentuate than to annihilate differences. The business man of yesterday's every action did the first and nothing else; the business man of tomorrow will do the second thing.

A Brewery System

With Few Blanks, Complete Records of Full Truck-Operating Cost Are Being Obtained

All Records Are Made Out by People Other Than the Drivers

THE following record system used by the Lion Brewery, New York City, for keeping track of the work done by its automobile trucks and the cost of this work is a good illustration of how a truck fleet of medium size may be handled efficiently. The above-named brewing concern uses twenty-seven trucks, eighteen of which are of the gasoline type and nine electrics. Among the gasoline trucks, ten are 5-ton, five 3-ton and three 7-ton models. The electrics are all of the 3-ton type. This firm, which is gradually motorizing its entire delivery system, uses electrics for local deliveries and gasoline trucks for long-distance hauls, the average traveling capacities of gasoline vehicles being from 50 to 58 miles a day, and that of electrics from 20 to 25 miles, according to the company's records.

In considering the system of the Lion firm, one fact stands out strikingly and apparently advantageous. This is, that the drivers of the trucks are not troubled by attendance to the system. The latter covers travel reports, gasoline, oil and current consumption reports, repair reports and accounts of cost. In every case, the records are kept by the other party; gasoline-and-oil or current attendant, repair shop foreman, Jones recorder and accountant. This permits the driver to concentrate on his work proper without being bothered by details which really should be up to other people to attend to.

The principal forms of the system are: (1) the daily Jones recorder card; (2) the daily gasoline and work report; (3) the monthly record of weight carried and fuel used; (4) repair record; (5) yearly cost record, giving fuel, oil and weight carried, cost of repairs, etc., for every month and the whole year. Finally, a still more detailed cost sheet covering this information, together with averages calculated on their basis.

(1) The recorder card, Fig. 2, is used in connection with the well-known Jones recorder, being a blank of 4.13 inches diameter. In the case of the Lion Brewery, the blank is printed red on heliotrope paper, and the reverse side, not shown here, has spaces on which the date, truck number, driver number, route, number of miles traveled during the day, time of the truck being out of the garage, number of stops, gasoline used during the day, actual running time, time spent standing, weight carried during the day and special remarks are entered. When the truck starts out in the morning, the first three points of information mentioned are written on the back of the recorder blank. After the day's run is complete, the other data are entered, being obtained partly from the line made by the recorder pencil and partly from the data appearing on

(2) The daily gasoline and work record, Fig. 5. This form consists of a blank, 6 by 3.75 inches, printed black on thin yellow cardboard. The details which are required to form totals entered on the reverse of the recorder card are first entered on this card. The card is held by the checker in the garage who takes notations when the truck leaves and arrives. The weight is determined by the number of kegs of beer bottle boxes carried, which are of standard weight. The card provides for three trips a day, and this is ample. When the card is complete, the checker gets the gasoline report by seeing the entry in the book of the gasoline-and-oil man. This information being entered, the card is sent to the office, together with the recorder card where it is held in a reference file until the end of the month.

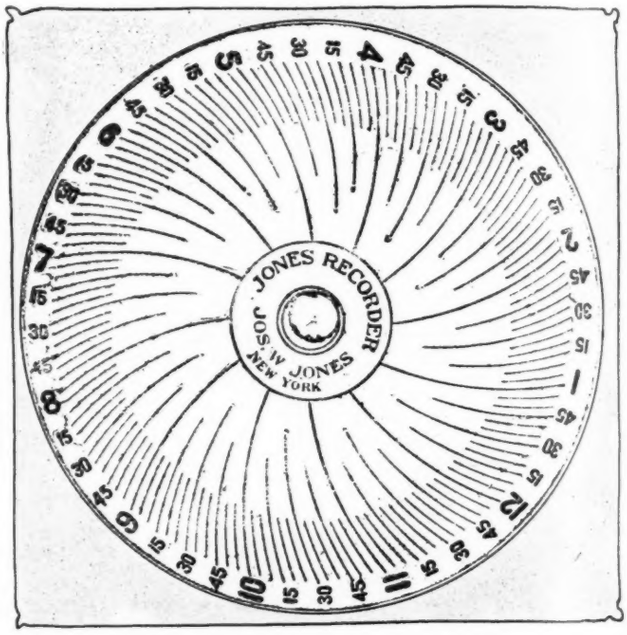


Fig. 2—Blank card used in Jones recorder

Form 130

AUTO TRUCK EXPENSE DISTRIBUTION

MONTH OF 191

	Total	110	112	114	116	118	120	122	124	126	128	130	132	134	136	138	140	142	105	107	109	111
Miles																						
Gas Gal.																						
Oil "																						
Kerosene "																						
Alcohol "																						
Outside Repairs																						
Home Repairs																						
Misc. Charges																						
Gasoline																						
Oil																						
Kerosene																						
Alcohol																						
Grease																						

Fig. 1—Blank for keeping monthly records of full truck cost and all its individual items

(3) At that time, all the records are segregated and grouped by the trucks to which they refer, and the monthly report, Fig. 1, is made out. This form is printed on yellow paper, 17 by 5.25 inches, ruled red and blue and printed in black and all the various data are entered, for which space is provided.

(4) Repairs which are made in the shop of the Lion company are recorded on the repair form, Fig. 3. This form is 4.25 inches square, printed on thin white paper and lined blue and red. All that is entered on the form is the date on which the repair work was done, the number of the automobile repaired, the number of the workman in the shop who did the work and the hours spent by him on the job, together with the total cost of the repair which includes the labor and the cost of the material used for the work. These repair records are made out by the foreman of the repair shop, and when completed are signed by him and sent to the office of the company. Whatever repair work is done outside of the company's shop, is of course charged to the company and the office charges the various truck accounts with the total repair costs of each individual truck.

(5) At the end of the year the accounting department computes the records of each truck for mileage made, weight carried and gasoline used during the entire year. The form, Fig. 4, is used for this purpose and it is printed on both sides, giving space for 6 months entries on each. The figures referring to the three kinds of data are entered on this form for every day of the year, so that it is easy to figure up the total weight carried and gasoline consumed during the year and to calculate averages on the basis of the mileage, both for the entire year and for periods of 1, 2, 3 or 6 months.

FORM 121.

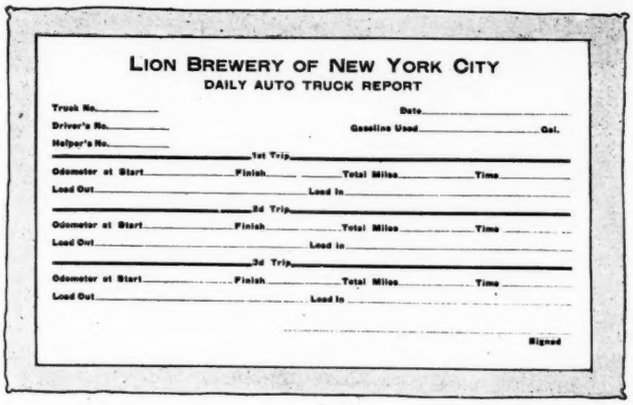
AUTO TRUCK REPAIRS

TIME CARD.

DATE_____

MAN'S NO.	AUTO NO.	HOURS	AMOUNT	

Fig. 3—Repair card used in company's shop



LION BREWERY OF NEW YORK CITY

DAILY AUTO TRUCK REPORT

Truck No._____ Date_____

Driver's No._____ Gasoline Used_____ Gal.

Helper's No._____

_____1st Trip_____

Odometer at Start_____ Finish_____ Total Miles_____ Time_____

Load Out_____ Load In_____

_____2d Trip_____

Odometer at Start_____ Finish_____ Total Miles_____ Time_____

Load Out_____ Load In_____

_____3d Trip_____

Odometer at Start_____ Finish_____ Total Miles_____ Time_____

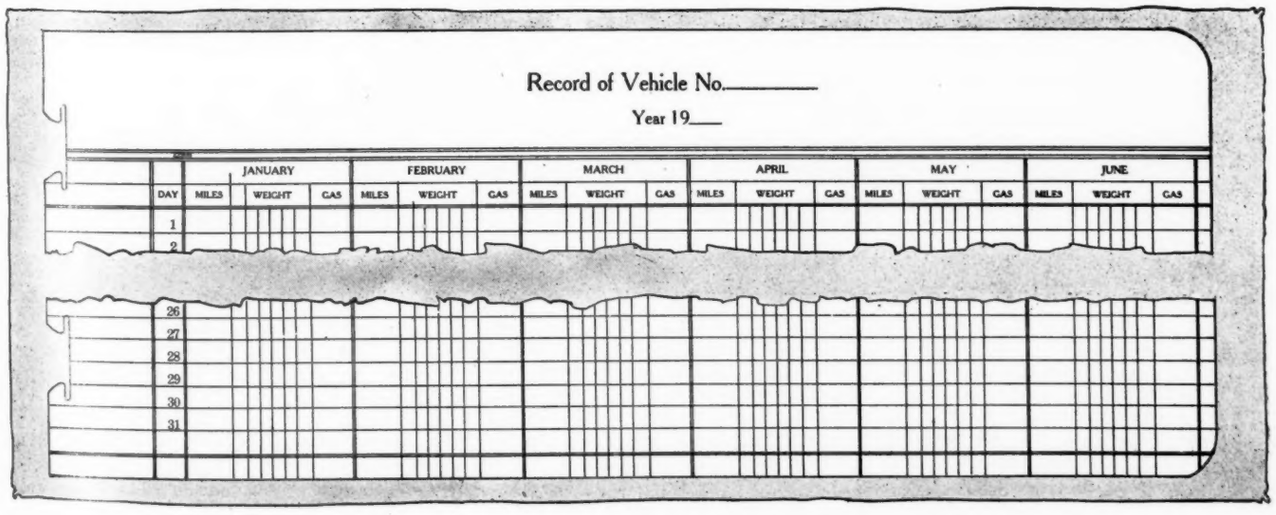
Load Out_____ Load In_____

Signed

Fig. 5—Daily fuel, load and travel card

There is another form in use by the Lion company. This, however, does not appear on a specially prepared blank, but is made up after the end of the year and contains all the information summed up from the various forms described above. This general sumup is designed with thirteen columns, one for every month and a column for the total amounts of the year. The total amount of gasoline, oil and tires used by the company during each month are noted on this blank as are the weight carried, the mileage made, the hours run, the amount of repair work done, and the costs of tires used. All amounts of one kind appear in one line and in the thirteenth column are footed to a total. A second section of the report appears under these data and contains the monthly and yearly averages such as gasoline, oil, repair and tire cost per mile traveled and the weight carried per mile. Furthermore the average running cost per mile and the cost per ton are given on this report.

A special report form is used to keep record of the tires used by the trucks. One blank is used for every truck being marked with its number and on it spaces are provided for entering the following information relative to the tire on each of the four wheels of the truck. The date on which the tire was mounted on the wheel, the mileage for which it was used and its make and cost are entered on this form so that the company is in a position to get the most detailed information on tire cost on its trucks.



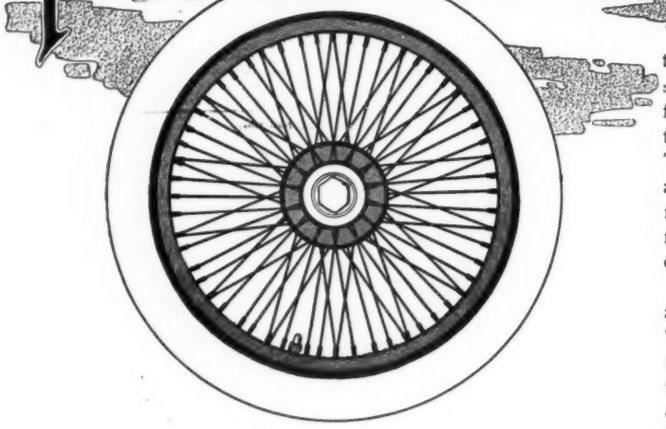
Record of Vehicle No._____

Year 19___

DAY	JANUARY			FEBRUARY			MARCH			APRIL			MAY			JUNE		
	MILES	WEIGHT	GAS	MILES	WEIGHT	GAS	MILES	WEIGHT	GAS	MILES	WEIGHT	GAS	MILES	WEIGHT	GAS	MILES	WEIGHT	GAS
1																		
2																		
26																		
27																		
28																		
29																		
30																		
31																		

Fig. 4—Fuel, weight and mileage record covering these data for every day in a full year

Pros and Cons of Wire Wheels



Triple Spoke Wheels Designed To Take Great Lateral and Driving Strains—Method of Carrying Spares

WIRE wheels were in use in the early days of the automobile. But the constructional methods of that time were not along lines that adapted this type of wheel to the peculiar road conditions required by the new vehicle. The wire wheel was therefore soon dropped on the superior showing of the wood artillery wheel, which continued to hold its position unchallenged until the introduction of the Rudge-Whitworth design in England.

Besides greatly improved construction, perhaps the feature which has contributed most to success of the modern wire wheel for automobiles is the invention of the triple spoke type, and it may be of interest here to outline the various functions of the three sets of spokes constituting the triple spoke wheel.

The vertical section, Fig. 1, shows the arrangement of spokes usually followed. It will be noticed that the outside set of spokes A is considerably dished, while the inner set C lies practically in a vertical plane. There are two reasons for this disposition of the spokes. First, the plane of tread is brought well over the inner end of the hub, thus keeping the wheel track small, and in the case of the front wheels preventing the dangerous strains that would follow on a large overhang of the steering knuckles; and second, the wheel itself is thereby rendered capable of resisting a great lateral shock. This latter point is brought in Fig. 2. Supposing the lower part of the rim to be subjected to a blow in the direction of the arrow, as when the car is brought up abruptly against the curb, practically the whole of the shock is taken in tension by the outer set of spokes A, the dished position of which render them peculiarly fitted to receive it. The spokes B and C, owing to their position are incapable of resisting such a blow to any great extent. Their function is almost wholly confined to driving and braking, although the slightly oblique position of the spokes B also offers resistance to lateral shock in the opposite direction. In automobile driving, however, a blow from the inside is rarely encountered.

All three sets of spokes radiate tangentially from the hub, but at different degrees corresponding to their respective functions. Thus the outer spokes A depart only slightly from a strictly radial lay-out, Fig. 1, and are not intended therefore to contribute to the drive from hub to rim. The spokes B and C are, on the other hand, arranged tangential to a circle almost as large as the hub flange to which they are attached. By this arrangement half of each set are in the best tensional position to take the driving strains, while the other half, issuing in the opposite direction from the hub, deal in a similar manner with the braking strains. This point is illustrated in the right-hand view, Fig. 1, in which the upper half of the wheel is shown only partially assembled, the spokes issuing in one direction not being shown.

The strains to which tangential spokes are subjected in practice is indicated in the diagram, Fig. 2. Here, two spokes are shown in the position they occupy in the wheel. When driving the hub in the direction indicated the existing tension of the right hand spoke is increased by a pull in the direction of the arrow, while the same turning force produces an opposite effect in the case of the other spoke, reducing its tension by the same amount. One of these spokes transmits the drive and the other offers the necessary resistance to braking strains. The function of each is quite distinct, one of them being out of action at all times.

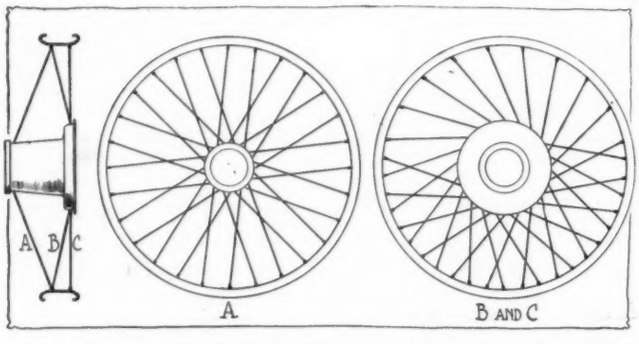


Fig. 1—Constructional diagrams of the triple spoke wire wheel, showing layout of spokes

Carrying Spare Wire Wheels

The means of carrying the spare wheels on a car equipped with the wire type is a similar problem to that met in the case of demountable rims. But there is this difference: The wire wheel, being complete with its hub, permits an easier solution owing to the fact that a simple stub or dummy hub is all that is necessary for a firm support. With the demountable rim

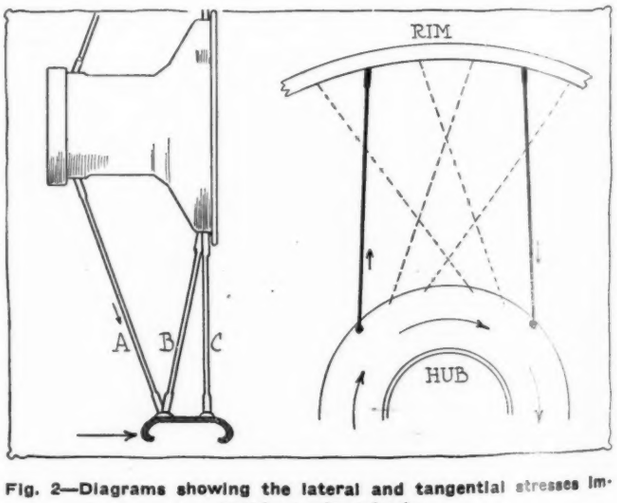


Fig. 2—Diagrams showing the lateral and tangential stresses imposed on wire wheels

the same rigidity of attachment can be secured only by the use of a framework or series of clips attached to a strong bracket. In either method, the difficulty of combining structural strength with sightliness is apparent.

It is true that although the dummy hub fixture has shown points of undoubted superiority in many European cars so fitted there are still large numbers of cars fitted with wire wheels in which the spare is carried in brackets of the type associated with spare tire carrying. The former method, usually applied in the running board position, has proved entirely satisfactory as far as the actual fixing is concerned. The dummy hub was arranged on a bracket mounted on the running board in such a manner that the tire did not come into contact with any part of the car.

The running board position for spare tire carrying, however, is rightly passing out of favor. The motorist is becoming more critical of the beauty of line in the appearance of his car and he wants also to be able to enter the car from either side. Carrying the tire in the position referred to offends in both these particulars.

An interesting method of surmounting these objections is that shown in Figs. 5 and 6. This consists of a dummy hub capable of taking two Rudge-Whitworth wheels, mounted at the back of a Lanchester car. A section is given in Fig. 4 in which the hub itself will be seen to consist of a plain hollow cylindrical stub, flanged at its inner end where it is bolted direct to the body of the car. Another flange, turned on the shaft provides an abutment against which the wheel hubs are tightened by means of a conical locknut exactly similar to those used in fitting the wheels to the axles. A distance ring, also conically faced is interposed between the two hubs, so that when tightened up both wheels are firmly centered and there is no possibility of moisture entering the interior of the hubs.

White Special Wire Wheel Hub

Fig. 3 illustrates a type of detachable wheel hub which is the subject of a patent application by J. M. White, Philadelphia. The special feature of this design is that it provides for both wire and wood wheels. The inner hub H, mounted on ball bearings, has eight splines S machined on its outer surface which transmit the drive to one or other of the alternative wheel hubs W and A. The wheels are centered and carried on the conical surfaces C, but the means of locking to the inner hub is not shown in the drawings. It is intended that both front and rear wheels have the same size hubs so that the wheels are interchangeable.

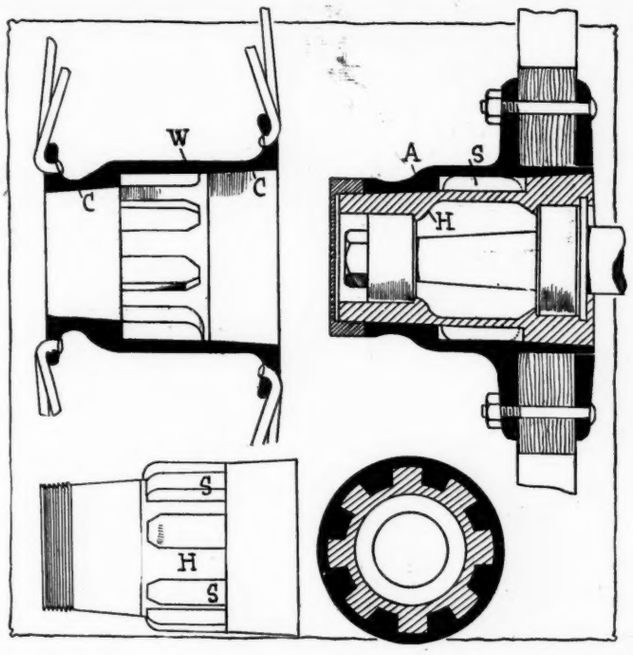


Fig. 3—White design of hub for use with wire or artillery wheels

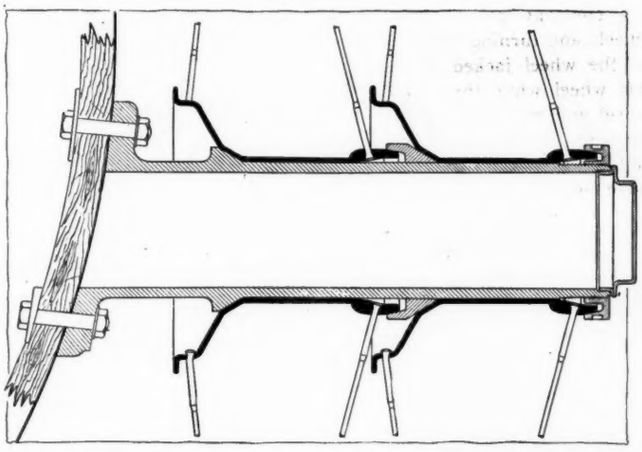


Fig. 4—Section through dummy hub designed to carry spare wheels

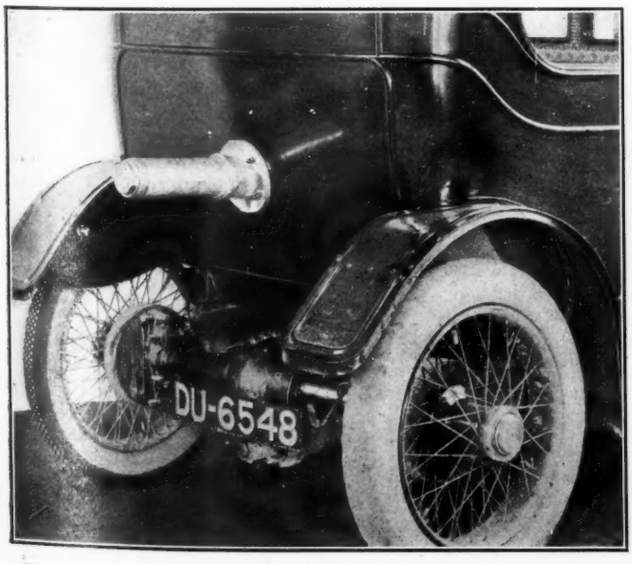


Fig. 5—Showing dummy hub carrier for spare wire wheels attached

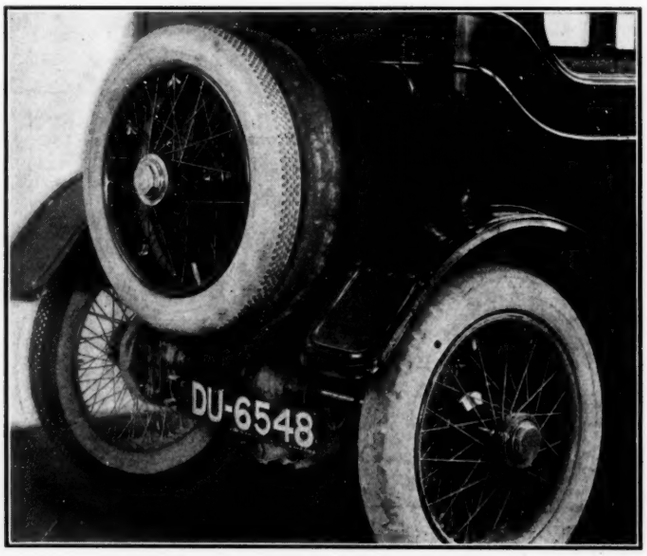


Fig. 6—Two Rudge-Whitworth wheels in place on the carrier

Finding the Gear Ratio of the Car—Cutting Off Intake—Recharging Magneto Magnets—Specifications of Cylinder Oil—Putting on Electric Light—Wiring for Reduced Voltage—Inclosing Valve Action—New Lamps

Determining Gear Reduction

EDITOR THE AUTOMOBILE:—Will you tell me some simple way to find out the gear ratio of our Pope-Hartford car?

2—What would be the increase horsepower if gear ratio was raised from 2 to 1 to 3 to 1 and also if raised to 3 1-2 to 1.

We do not care to exact figures only approximately. This car has 36-inch wheels.

We have tested our car this way after being told it was geared too high. When turning flywheel around twice it turns rear wheel around 1 1-8 revolutions.

Danby Four Corners, Vt. W. F. OTIS & SONS.

—You may find the gear ratio by jacking up one of the rear wheels and turning the crankshaft over once. Put a chalk mark on the wheel jacked up and have a man note the rotation of this wheel while the crank is being turned as in Fig. 1. The wheel will turn twice as far as it would if both wheels were in operation owing to the action of the differential. It is therefore, necessary to divide the number of revolutions made by the rear wheel by 2. The number of revolutions of the motor required to revolve rear wheels once can then be readily found. If the rear wheel turns 1 1-8 times to one revolution of the crank the gear ratio can be found as follows: One-half of 1 1-8 is 9-16. We then have the proportion 9-16 revolution of wheel is to 1 revolution of wheel as 1 revolution of crankshaft is to number of crankshaft revolutions to revolve wheel once, or:

$$9\text{-}16 : 1 :: 1 : X \text{ or, } 9X = 16 \text{ and } X = 1\ 7\text{-}9.$$

This gives a gear ratio of 1 7-9 to 1. You have probably erred in your observation and ratio is 2 to 1. This would mean that your wheel revolves once to a revolution of the crankshaft instead of 1 1-8.

2—A change in gear ratio would not affect horsepower delivered by motor. When the gear ratio is made lower you will not have to shift as often.

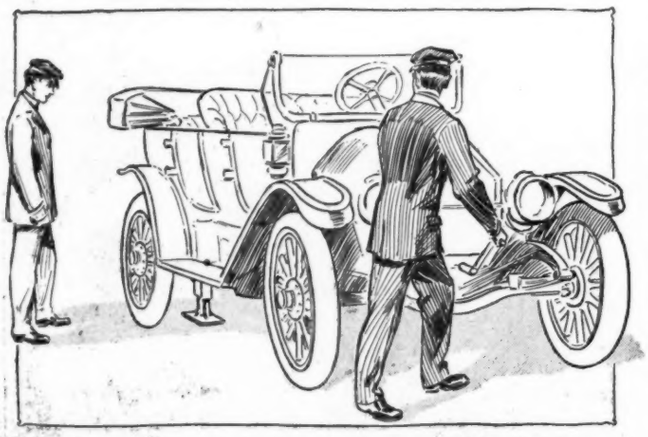


Fig. 1—Determining the gear ratio with one wheel jacked up. Differential causes the wheel to revolve twice as fast as if both wheels were jacked up

Changing Manifold Design

Editor THE AUTOMOBILE:—I have a 1913 five-passenger car, four cylinders, bore 3.25 inches, stroke 5 inches and it does not seem to have the power it should have, especially on an upgrade. I have changed the style carbureter to an old standard make and that made a great improvement, but I still have to drop to a lower gear on an upgrade. I thought of shortening the intake manifold, which is 11.75 inches almost straight up, about 1.5 inches, this I think is quite a draw. Would you advise this shortening? It will not interfere with the gravity feed to the carbureter.

Bayonne, N. J. OLD SUBSCRIBER.

—If you can change the manifold of your car without affecting the feed of the gasoline to the carbureter it would be a good idea to do so. It is an advantage to have the carbureter as near the engine intake as possible because it cuts down the recondensation of the gasoline in the upper part of the manifold. This is great source of power loss and hence should be avoided if possible. If the gasoline tank is carried fairly low however, it will be impossible to make the change in the manifold length because it will lift the carbureter to such a height that when the gasoline supply is low and the car is on a stiff upgrade it will be impossible for the gasoline to flow from the tank to the carbureter. You can get around this by changing the location of the tank also if so desired. If the tank is swung on the rear of the car as in some makes that are still using gravity feed it would be well to change the location to a point beneath the front seat or under the cowl. Generally when the tank is carried on the rear of the car the gasoline is fed to the carbureter by a pressure system of air taken from the exhaust pressure or from the compression pressure in the cylinders.

When the gasoline leaves the carbureter it is atomized and is in such a condition that it is very readily vaporized. When it comes in contact with the walls of the manifold, however, there is a marked tendency for the gasoline to go back to a globular state. This means that the gasoline will enter the cylinders in a condition that is very bad as far as securing the maximum power is concerned. The evils of gasoline in globular form may be readily determined by analysis of the exhaust gas products. It will be seen from this that the unburnt products thrown out of the cylinder are higher in percentage than when the gasoline is fully vaporized.

Had Hot Engine, No Spark

Editor THE AUTOMOBILE:—After a 20-mile run with a Ford T, I had much difficulty in starting. Could find nothing wrong, but had no spark. A bystander said that was a frequent occurrence with a hot engine. Was he right? In that event would the use of batteries be advisable?

Dixon, Cal. A SUBSCRIBER.

—The bystander was wrong. It is much easier to start a hot engine than a cool one. The trouble was probably that the spark-plugs were full of soot or that the magneto needs re-

charging. The plugs should be cleaned regularly or else they will become foul and it will be impossible for the spark to jump the gap across the points. After a time the magnets in a permanent magnet machine become weak. When this occurs the current generated at low speed is so slight that it does not furnish a hot spark. It would be best for you to take the car to the nearest Ford service station and have the magneto examined with a view of finding out whether the magnets need recharging. It would also be a good idea to go over all the wiring to see if there are not some terminals which are fastened so loosely as to be a source of loss of the electric current.

Good Oil for Northway Motor

Editor THE AUTOMOBILE:—What are proper specifications for oil to be used on 40 horsepower Northway motors? We have been very much interested in your oil tests and before giving our contract for this year would like your advice on an oil suitable for our use as we use quite a little and have had trouble with some makes of oil running uniform one barrel good and next barrel no good.

2—Kindly tell me the difference between a three-quarter floating and a floating rear axle?

Coatesville, Pa. W. G. Y.

1—Specifications for a good cylinder oil such as laid down by the Society of Automobile Engineers are as follows:

Specific gravity .....28 to 32 Baumé
Flash point above .....400 degrees
Fire test not less than.....450 degrees F.
Viscosity at 100 degrees F. Sayboldt meter not over 300 seconds.
Viscosity at 210 degrees F. Sayboldt meter between 40 and 50 seconds.
Carbon residue not over .....50 per cent.

2—As far as actual performance and working stresses are concerned the three-quarter floating axle is the same as the floating. In the floating axle the end is free from the wheel and by simply removing the hub cap the axle can be withdrawn while in the three-quarter floating axle, the axle shaft is keyed to wheel. In the latter axle the wheel and axle shaft can be pulled out together. The weight of the vehicle is carried in both cases by the axle housing.

Suggests Revolution Counter

Editor THE AUTOMOBILE:—Engines are designed to get best results, power, economy, wear, etc., at what may be called a normal speed or revolutions per minute. So why not have an indicator on dash or somewhere in sight, showing what the engine is making as to revolutions, just as on a steamboat? Most amateur drivers have no idea of the speed at which the engine is turning.

New York City, N. Y. F. H. HOBBS.

Wants Electric Light on Car

Editor THE AUTOMOBILE:—What are some of the best independent electric lighting systems which can be installed on a motor? My car is a 1912 Overland, Model 60 F.

2—What candlepower globes are best for the headlights? I expect to do some country-road work. What power globes for side and tail lights, also for small dash lights?

3—What will be the current consumption of the lights you suggest?

4—What style and size of lights would you suggest?

5—What will be the approximate cost of this system?

6—What should it cost to have an 80 or 100 ampere-hour storage battery charged?

7—Would it be possible to charge such a battery off a 200-volt D. C., and how would one go about it to cut down the current?

Lincoln, Neb. C. J. F.

—1—Any of the independent generators which are now on the market will render sufficient current to operate a lighting system for your car. It should be installed by an expert, however, as it is necessary to fit a regulating device in order that the voltage delivered by the generator will be practically constant at all speeds. This is an absolute necessity in order that the charging rate of the storage battery be correct or in order that the filaments of the light will be protected against the possibilities of blowing out on account of excessive electric pressure. In case you desire to fit a storage battery and lamps without a generator this is also possible and may be done by yourself. This will avoid the necessity of fitting any extra parts to the car or motor in order to drive the generator but will involve the trouble of charging frequently.

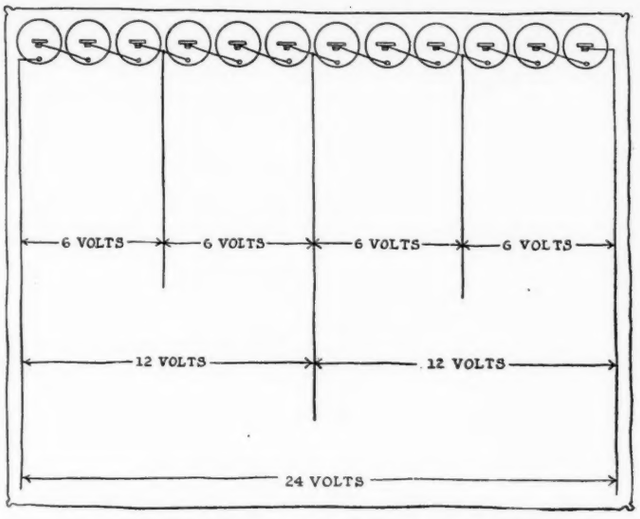


Fig. 2—Wiring twelve 2-volt cells for reduced voltage

2—The headlights could be 21 candlepower each, the sidelights 3 candlepower and the tail light 2 candlepower. The dash lamp could also be 2 candlepower.

3—With the head and tail lights lit, 44 candlepower would be produced with a 6-volt current at 7.42 amperes. With side and tail lights 8 candlepower would be produced at a current consumption of 1.68 amperes. With all lights lit 50 candlepower would be produced at 8.68 amperes.

4—Six-volt lamps of the above candlepower would be good because they are standard and can be secured anywhere.

5—The cost would vary according to the battery and fittings. It is impossible to state a definite figure without knowing details.

6—The cost for charging an 80-ampere hour battery is 50 cents.

The cost for charging a 100 ampere-hour battery is also 50 cents In either case 25 cents is charged should it be necessary to add water.

7—You could use the current supply you mention very well by simply inserting a rheostat in the line to reduce your voltage to about 12 at an ampere flow of about 16 in the case of one type of well-known battery. It will be necessary to follow the maker's instructions exactly as regards charging rate. The rheostat to take care of this work would cost about $25.00.

Fuel for Racing Cars

Editor THE AUTOMOBILE:—What ingredients and what proportion do racers use for fuel in racing? Is it injurious to the motor? Where on a Ford car should open ports be put in? What are the advantages of open ports in racing? How could the holes be plugged? What is a good make of carbureter to use in speed work?

Carsonville, Mich. R. A. MCGREGOR.

—Racers with rare exceptions are using ordinary gasoline of about 65 test. The days of doped fuel are past and discountenanced in racing circles. Open ports act as an auxiliary exhaust valve to clear the cylinder much quicker than would be possible with the one exhaust valve. The open port valve has also been practically abandoned. The port is placed in the cylinder at the bottom of the stroke so that when the piston reaches the bot-

tom of the stroke it uncovers the port and allows the gases to escape quickly. The area of this port should be about the same as the area of the exhaust valve. The height of the port in the cylinder wall should be such that the piston uncovers the port simultaneously to opening the regular exhaust valve.

Wiring for Reduced Voltage

Editor THE AUTOMOBILE:—Is it possible, and if so, how are the connections made for a storage battery of 12 cells to be at the same time:

Connected in 1 group, 12 cells in series, giving say 24 volts.
Connected in 2 groups in parallel, 6 cells in series in each group giving, say 12 volts.
Connected in 4 groups in parallel, 3 cells in series in each group, giving, say 6 volts.

Several of the wiring diagrams in connection with self-starters you have recently published seem to call for this arrangement in whole or in part. To the amateur it seems an impossibility to be done without the aid of a pair of wires from each cell to a controller and I see no mention of that. It would seem in the absence of further explanation that once connected as above in four groups in parallel that the addition of other connections to put these groups in series would be useless; that current would continue to take the shortest path and only give the 6 volts.

New York City. D. W. SEAVER.

—The arrangement of the wires is that shown diagrammatically in Fig. 2. In a 24-volt storage battery all that is necessary where a current of 12 volts is required is to wire in such a manner that half the cells are in use. In the illustration the cells are shown as if they were ordinary dry cells. The same rule applies to the storage battery, however, the wiring being taken off half the cells to secure two 12-volt lines. When 6-volt lines are required the 12-volt lines are divided in the same manner as the 24-volt line is divided by taking one wire from the center of the cells making up the voltage to be divided. In the same way any dry battery may be subdivided.

Grease Leaks Into Crankcase

Editor THE AUTOMOBILE:—Will you please tell me how to prevent heavy oil or grease working from timing gear case into crankcase on a model K Pullman motor? I am sure there is no way except through front crankshaft bearing. The cases are packed with a fibre paper packing, the front bearing cap has felt packing between that and case. Therefore it must work through bearing. This causes the motor to be plugged full of carbon about every 500 miles.

Hammondsport, N. Y. I. J. BRUNDAGE.

—It is practically impossible to prevent a leakage of grease from the timing gears into the crankcase. As you state, it works through the bearing and therefore no amount of packing will help the situation. The only answer to the problem is to lubricate the timing gears with the same lubricant that you use in the cylinder. If you are troubled perpetually by the leakage of the grease into the crankcase the best thing to do would be to tap a lead into your oil pump line and allow the lubricating oil to circulate into the timing gear case. The overflow of the oil from the timing gear case should take place from a spot above the line of mesh with the gears so that they run submerged. The overflow of oil passes into the crankcase and mingles with the oil there.

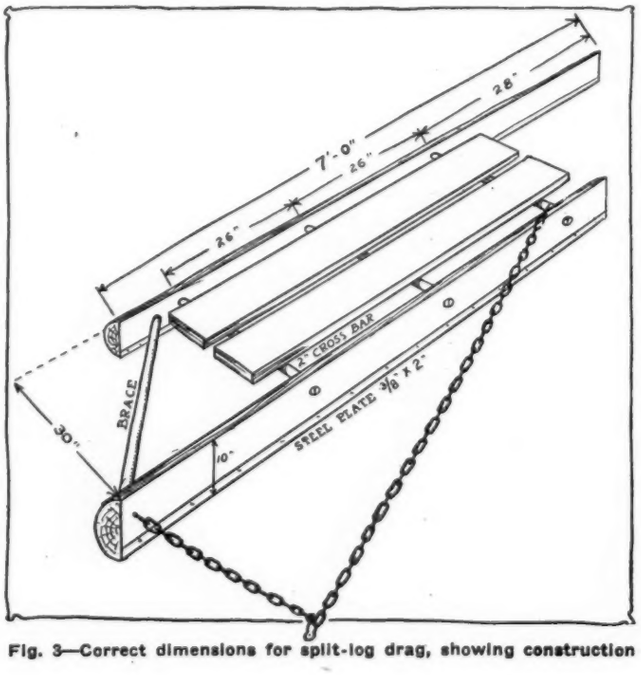


Fig. 3—Correct dimensions for split-log drag, showing construction

How to Inclose Valve Action

Editor THE AUTOMOBILE:—May the following be classed as a new one? The writer thinks there are many owners of old cars without inclosed valve stems, who would be glad to know a simple, cheap and quick method of silencing valve action and keeping out dust and dirt. See Fig. 5.

Take an ordinary paper tube such as is used for mailing drawings, blueprints, or calendars, and cut to proper length, make tight fit lengthwise, split tube its full length and spring it around the valve stem and spring, close with a wire or better a light hose clamp. Paint the tube black or aluminum and there you are, dust proof and sound proof. Cost about 10 cents, labor one hour. To keep tube from becoming oil soaked shellac or varnish inside and outside before putting in place.

New York City, N. Y. OLD TIMER.

—This is not only a new one, but if carefully done should be a very useful tip.

Split-Log and Plank Drags

Editor THE AUTOMOBILE:—Would you kindly tell me the difference between the split log and the plank drags? I understand that both of these are used with great success on dirt roads and as there is a stretch of bad road in this vicinity that we would like to smooth out, I would like to see an illustration of both these drags in order to determine which would be easier to construct. It would also help if you could furnish the dimensions recommended by the best makers of these devices.

Danville, Va. READER.

—The two forms of drag are very much alike except that, as the names imply, one is made from planks and the other from a split log. The two devices are shown in Figs. 3 and 4. The details of their construction can be gathered better from these illustrations than by any other means. They are very useful for dirt road work and when frequently run over the road render it superior to many of the artificial surfaces.

Installing Lighting System

Editor THE AUTOMOBILE:—I would like to equip my 1910 model 17 Buick with electric lights, two 16-candlepower headlights, one 2-candlepower for rear. Could I light them from an 80-ampere, 6-volt battery? If so, how long would it light without having to be recharged? I am using a magneto on a stationary engine which puts out 14 volts. Would it charge the battery? How long would it take? What is the life of a battery?

Sutherland, Iowa. LAWRENCE FLINDERS.

—It would be possible and practical to run your lighting system from an 80-ampere-hour storage battery and light your head and tail lights. That is provided you have some source handy from which to recharge the battery. The battery would last approximately 14 hours with the tail and headlights burning and 225 hours with just the tail light.

The magneto of which you speak cannot be used to store the battery. A magneto generates an alternating current and therefore cannot be used for storing the battery. A study of the four

articles on electric lighting and cranking appearing in issues of January 16, 23, 30 and February 6 will make this matter clear.

The life of a storage battery is indefinite. It will last as long as you give it proper care.

New Carbureter on Hupmobile

Editor THE AUTOMOBILE:—I have a Breeze carbureter on Hupmobile. Will another make carbureter do better? If so, what make?

2—Will a fan be an improvement on the machine?

Jamestown, N. Y. CHAS. J. NORQUIST.

—1—The Breeze carbureter should give you entire satisfaction with the Hupmobile car. There is no necessity of changing unless you wish to experiment.

2—The fan in the Hupmobile is contained in the flywheel and is sufficiently efficient unless you have some extraordinary work to do. If it is necessary to be perpetually climbing on low gear, the addition of another fan would help to keep the motor cool.

Use of Condensed Gasoline

Editor THE AUTOMOBILE:—Kindly inform me what difference there is between gasoline refined from crude oil and that condensed from natural gas, as applied to its use in motor cars?

I can buy 76 actual test gasoline, condensed from the natural gas at the wells, for about the same price as I am now paying for 54 gasoline refined from crude oil.

What changes, if any, should be made in the carbureter. Will this condensed gasoline be in any way harmful to the cylinders or other parts of the engine? In fact, I should like your opinion as to the apparent benefits to be derived from this condensed gasoline.

Is gasoline distilled from natural gas more dangerous to handle or use in an automobile engine than the same test gasoline refined from crude oil, and why?

Chicao, New Mexico. W. H. DAVIS.

—Any hydro-carbon that you can burn will be good to use in your carbureter. The lower the gravity of the gasoline that you can burn, the more power your motor will develop because there are more heat units in the heavier gasoline. The refined gasoline would be better because there is more power in it. There is no danger in handling the condensed fuel as it is not brought into actual contact with flame. It is very volatile and hence must not be brought into a room with any other artificial light than electricity. The condensed fuel would not harm the engine or the carbureter.

It would not be wise to mix the two fuels because they are so different that the more volatile condensed fuel would be evaporated quicker and would leave the other fuel behind. The whole matter lies in the one rule of handling the lowest gravity fuel that you can successfully run through your carbureter.

Has No Cylinder Compression

Editor THE AUTOMOBILE:—I ground all my valves and timed same properly, decarbonized the cylinders with Presto-carbon remover, let each cylinder application stay in one hour and noticed there was no apparent leakage either at valves or around the piston, so I took it for granted that my rings must be all right. I tried all cylinders one at a time with a compresso-meter gauge, three cylinders had only 15 pounds, two had 40 and one absolutely none.

The engine is of the Premier make 6-60 and runs only 900 miles. The only trouble I have had is that one of the pistons seized and I think possibly it may have been the very one that now has no compression.

Bangor, Me. P. R. WILEY.

—It is very possible that the cylinder in which the piston seized has been spoiled. It might be that it will require reboring in order to restore it to proper condition. It is stated by those using liquid carbon removers that compression is generally low for a short time until the motor has been run for awhile. It then improves. You should have the defective cylinder examined after running for 200 or 300 miles and seizing if conditions did not improve at the end of that time. The rings may possibly have become lined up so that the slots are opposite each other, allowing the compression to leak through the resulting groove.

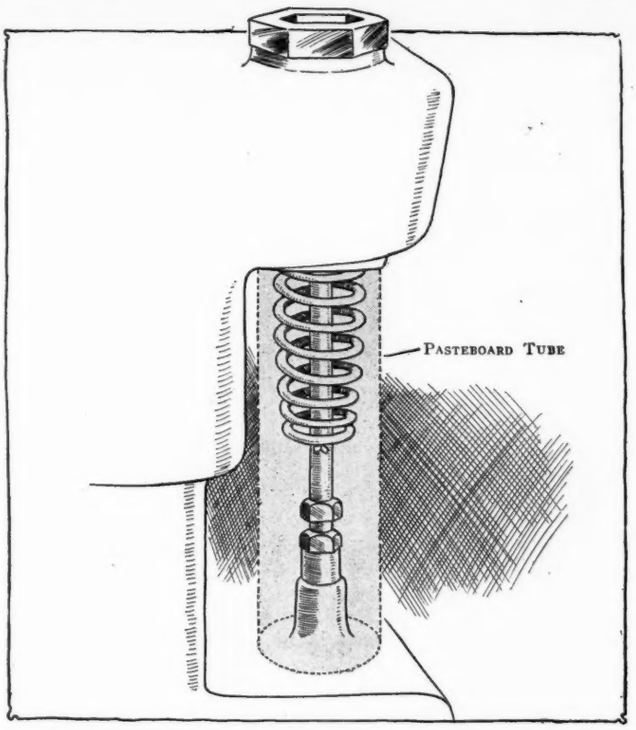


Fig. 5—Inclosing valve action by means of pasteboard tube

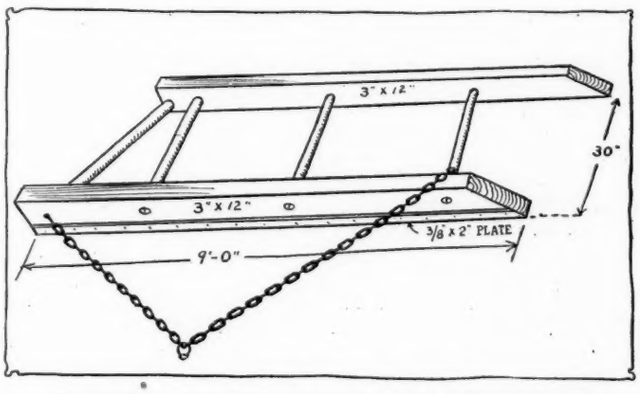


Fig. 4—The plank drag, a parallel to the split-log drag

Roads from Florida to D. C.

Editor THE AUTOMOBILE:—Being a reader of THE AUTOMOBILE, I take the liberty of asking you to send me any data you may have regarding the roads between Florida and Washington, D. C., as I am now touring in Florida and wish to drive there on my way home to Rochester, N. Y.

Daytona, Fla. WILLIS N. BRITTON.

—The roads along this route are better than they ever have been but it must be particularly emphasized that this statement does not mean very much. There are some very bad stretches of sand through Georgia in the neighborhood of Atlanta and Augusta. In Florida also there is much sand. The first part of the trip fair roads may be expected. At this time of the year the best course lies through Richmond, Raleigh, Pinehurst and Condon. Between Raleigh and Pinehurst some good stretches may be expected.

Demountable and Quick Detachable Rims

Interest in These Types of Rim Has Grown to an Unprecedented Extent During the Past Year and the Various Makes Were Very Much in Evidence at the Recent New York and Chicago Shows

ONE of the developments of the past year sufficiently noteworthy to be dignified as a tendency in automobile construction is the use of rims specially designed to facilitate the removal and application of tires, or, in other words to minimize the roadside troubles of the automobilist. These devices may be classified under three heads: First, the detachable type, in which the rim is arranged permits of removal of the tire without the physical effort required by the old style clincher rim; second, the quick detachable, in which the inner bead ring is secured in place by means of a locking ring, and third, the demountable type, in which the rim may be removed from the wheel.

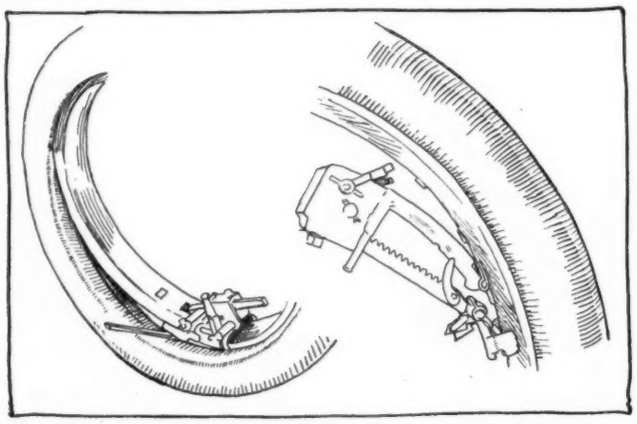
There are three classes of detachable rims—those in which two sections separate and allow the tire to be removed; those in which one side ring of the rim may be expanded and removed, as distinguished from the quick detachable type with its locking ring; and those of the expanding type which may be contracted to allow the tire to slip over the side rings. Specific advantages are being claimed for each of the three types.

Quick detachable rims may be classified as of three types, straight-sided, clincher and universal, which will take either straight or clincher tires, though there are a few special types such as the old-style clincher, in which inner lugs secure the tire to the rim, and the Fisk bolted-on type, which is fastened by bolts through the heavy tire base. Each of the latter types is used on demountable rims.

The most common variety of demountable rim is that in which bolts hold the rim in place on the wheel, the number of bolts used varying with the different makes of rim. Sliding lugs held in place by the bolts are sometimes employed to secure the rim, while in some the bolts hold wedges which, besides preventing side motion of the tire, expand it to set firmly.

In some rims the wedges are short and correspond with the bolts in number. In others the wedge is in the form of a single ring which it is necessary to remove before demounting the rim. In some cases, the wedge or wedges engage only one side of the rim while in other constructions they act on faces on both sides of the rim.

At the automobile shows an unusual amount of interest was shown this year regarding the various types of rims, in how little time they could be removed and replaced and in the principles of operation. In fact, so pronounced has been the demand for something of this sort to lighten the burdens of the puncture-provoked automobilist. Some of the leading devices for 1913 are briefly reviewed herewith, being taken up in alphabetical order for the most part throughout the descriptions, although for various reasons it was not practicable to do so in every single instance.



Segments of Booth demountable rim, showing the new power tool, which is a development of the past year

Alpha—Unusual Ring Operation

The demountable rims made by the Alpha Rim Company, New York City, consist of but three parts, the rim proper, the felloe band and the expanding flange ring. The felloe band is permanently fastened to the felloe and its back face is beveled while there is an annular channel on the front. This channel contains an expanding ring, which, contrary to usual practice, contracts to permit the removal of the rim from the wheel and expands to lock it in position. The rim is of the split type and is provided with two lugs which pass through the felloe band, being permanently connected by two toggle levers which are jointed together, the smaller having a square socket. The device is operated by inserting a special tool of simple design in this aperture. When the toggle is expanded it lies close to the rim where it is out of the way and self-retaining. It is the off-center position of the toggle when locked which comprises the locking feature, the tightness of the levers increasing in proportion to the increase in the strain on the locking ring.

The rim is of the ordinary clincher type and is provided with two bevels on its inner surface, one to correspond with the back bevel of the felloe band and the other to engage with the locking ring. To dismount the rim, the tool is inserted in the square socket and turned down. This contracts the ring, permitting the rim to be removed from the wheel.

Ashley—Novel Locking Attachment

The Ashley wire wheel has a demountable rim which is carried upon a felloe band, the principal novelty of the device consisting of the locking attachment. The rim is pushed onto the felloe band where it rests on a raised bead at the back. The front side of the rim contains a groove and in the felloe band, fitting into this groove, there is a split ring which is contracted or expanded by turning a toggle nut. By tightening the nut the two small lever arms, which are seen in the illustration, cause the ring to move laterally.

Baker—Adds a Bolt for 1913

The Baker bolted-on demountable rim consists of a permanent rim shrunk onto the felloe and a split rim which is held in position on the permanent rim by means of six bolts and wedges. Last year only five bolts were used per wheel. Five are still used for wheels under 36 inches but most of the wheels fitted with demountable rims are no smaller. The rim cannot stick to the wheel after the bolts are backed out and the wedges are turned out of the way. A sleeve forces the wedge out when the bolt is backed off which prevents sticking of the wedge. There is also a space of .192 inch between the rim and the wheel band which keeps the rim from sticking on the wheel. The inner tube is passed through the split ring, the split occurring close to

the valve. On either side of the split there are two bosses and the rim is held rigid by means of an anchor plate.

Booth—New Power Tool for 1913

Booth rims are continued for 1913 by the Kelsey Wheel Company, Detroit, Mich. With the exception of the development of a new power tool for removal of the tire from the rim, no changes distinguish this year's product from that of 1912. With each set of rims are furnished an extra joint pin and drift pin and a brace wrench. The demounting feature of the Booth rim is as follows: Lugs passing through slots in the felloe band secure the rim to the wheel. Two gears, driven by an irreversible worm, spread the lugs so as to hold the rim firmly in place. In removing the rim the worm is turned in the opposite direction, contracting the lugs so that they may be drawn through the slots. Booth rims are made for either wood or wire wheels and with both clincher and straight-side quick detachable rims.

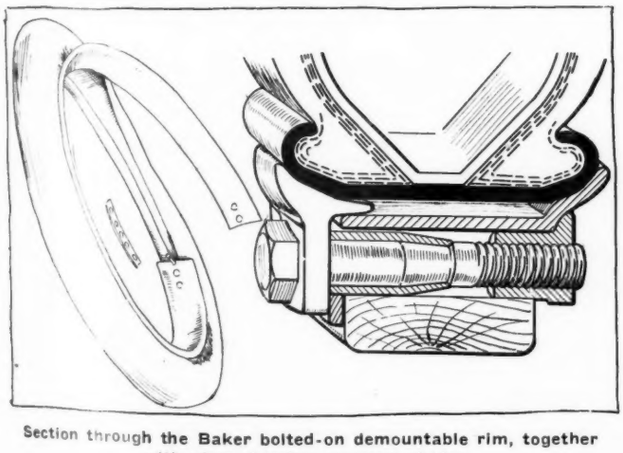
Detroit—Many Improvements This Year

For 1913 many improvements are apparent on the Detroit demountable rims which are manufactured for the Detroit Demountable Rim Company in the plant of the Weston-Mott Company, Flint, Mich. The wedges have been made smaller and more compact than formerly and the number of nuts which it is necessary to loosen before removing the rim has been reduced to four. The bolt has also been turned about so that now it is a part of the rim base while the nut only is operated. When the nuts have been loosened the short wedge members may be pulled outward, permitting the rim to slip over them.

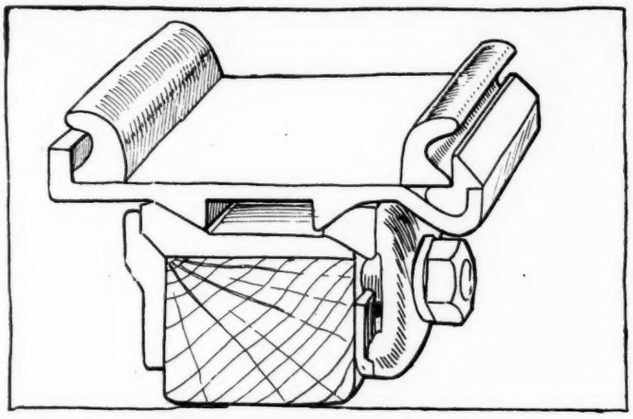
A special type of expanding ring is employed in the construction of the detachable rim. This is locked by a cross-tree which turns to engage two buttons on the inside of the rim. The openings for the buttons are cut at an angle so that as the cross-tree is turned the rim is expanded. Dirt and water are prevented from entering the casing by a small filler segment of the rim which is secured to the locking cross-tree. For contracting the rim if it should become rusted, a special tool is furnished.

Firestone—Q-D Demountable

These rims are of the quick detachable demountable type. The permanent rim is shrunk on to the wooden felloe and is beveled at both sides. The demountable rim is also beveled, one side resting upon the inner bevel of the rim, while the outer bearing is formed by a V-shaped clamping ring being placed in position and held by six clamps and nuts. By removing the nuts and clamps the clamping ring can be removed and the rim with the tire on it changed. The detachable feature consists of two concentric rings, one overlapping the other. The outer ring is split and fits into a depression in the rim. After the tire has been deflated and it is desired to remove the shoe, by pressing the inner ring against the tire, the split ring can be taken away, allowing the clincher side ring to be removed.



Section through the Baker bolted-on demountable rim, together with view showing removal of tire



Section through Firestone quick detachable, demountable rim, showing bevel feature on permanent and demountable rims

Fisk—Only Three Parts

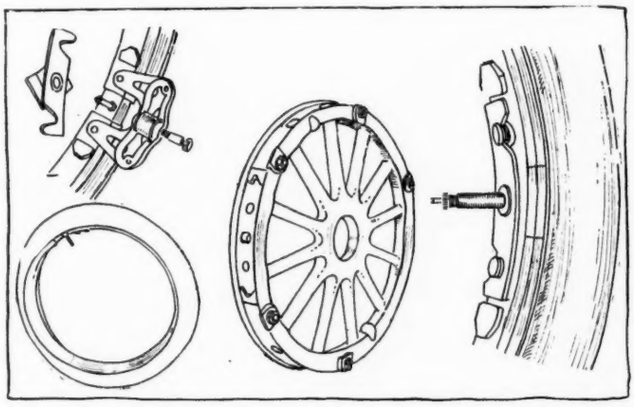
A special rim is necessary for use with Fisk bolted-on tires made by the Fisk Rubber Company, Chicopee Falls, Mass. This consists of but three parts, a felloe band with a wide outside bevel, the flat tire rim to which the tire is bolted and an expanding ring. The latter is of the wedge-shaped type secured by means of bolts through the wheel felloe. A dowel pin, .5 inch in diameter, engages a hole in the felloe band, preventing creeping. An angle valve makes it unnecessary to insert the valve on applying the rim and acts as a protection for the valve.

Funk—Bolted-On Demountable

Manufactured by the Englebert Tire Company, New York City, the Funk rim is of the bolted-on demountable type used in connection with the contracting type of quick detachable rim. No filler segments are necessary with this rim as it is of the overlapping contracting variety which, when expanded, forms a complete ring. The rim is secured to the wheel by five bolts and locking lugs, the removal of three of these permitting the demounting of the rim. For removing the tire from the rim a special breaking tool for overlapping and contracting the rim is provided.

Healy—No Felloes Are Used

Rims from the factory of the Healy Rim Company, Brooklyn, N. Y., are distinguished from practically all others in the field by the fact that no felloes are used on the wheel to which they are fitted. They are of the straight-sided, or clincher type, the steel rims being secured to the spokes by means of steel yokes which inclose the ends of the spokes. There are two parts to these yokes, one of the legs being fastened by a bolt and lock washer. Loosening all but a few of the bolts permits of turning the loose



Details of the Detroit rim, the view at the upper left giving an idea of the cross-tree used on the expanding ring this year. Turning the cross-tree expands the ring

legs of the yokes out of the way and removing the rim.

J-M

The Johns-Manville Company, New York City, has combined demountable and quick detachable features in the J-M rim. The rim and the felloe band are the principal factors in the demountable element. There is a bevel on the back of the felloe band against which the rim is jammed, being locked in position by six retaining lugs on the front of the band. When the nuts on top are loosened and the wheel revolved three of the six lugs drop clear of the rim. Then the nuts are tightened to keep them so and the wheel is turned in the opposite direction. The remaining lugs drop in a similar manner and then the rim may be removed.

There are two parts to the rim proper, the outer being rigid and the inner split. These parts overlap, being held together by dowel pins in the outer ring engaging holes in the inner ring. The tire is removed from the rim by prying up the ends of the inner ring so that it may be slipped off the dowels and the two parts of the rim separated. Among the special features of this type of demountable rims is its light weight.

Lambert

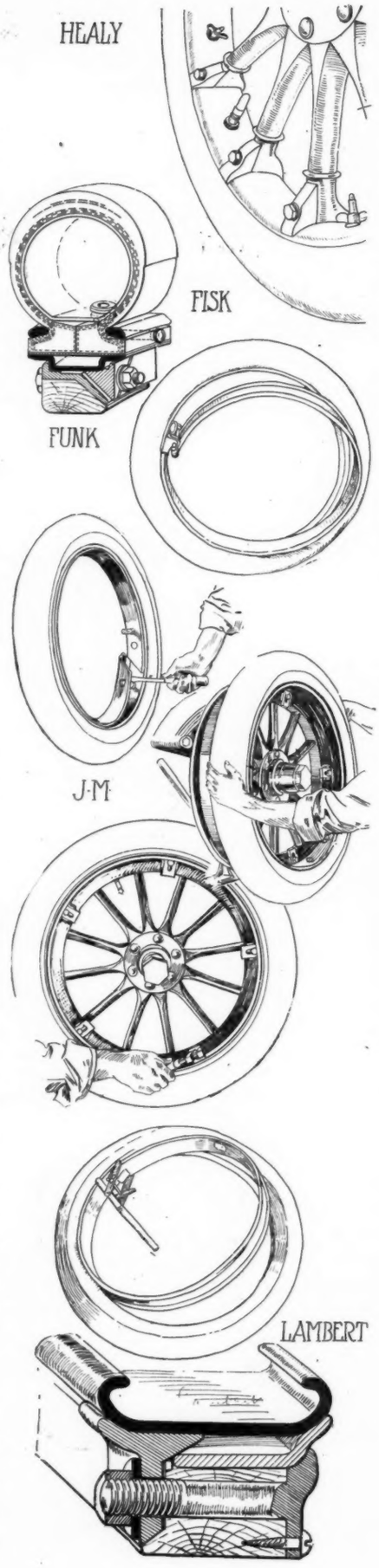
The Lambert rim, manufactured by the American Rim Company, Detroit, Mich., is composed of a felloe band secured to the wheel felloe with a bevel seat for the rim at the back. The operation of demounting is extremely simple, a single nut removed by a socket brace permitting the rim to be lifted from the wheel.

The rim is secured to the wheel at six points, the first being the adjusting wedge which is fastened to the felloe by a bolt. The mounting and dismounting lug is opposite this, being different from the adjusting wedge in that the bolt has a special locking device. This is released by means of the socket brace and automatically locks the bolt on the withdrawal of the tool. Of the four other securing pads, two are fastened to the rim and two to the felloe band.

The dismounting lug is locked by means of a ratchet disk, integral with the bolt head, which is engaged by a spring-actuated pawl on the wedge. There is a flange on the locking bolt which positively forces the rim from its place when the bolt is unscrewed. This is an advantage when the rim becomes rusted. A special tool is used to contract the rim in detaching the tire.

National

This rim is of the quick detachable type and is simple in construction. The main body of the rim is shrunk onto the wood felloe and two endless steel rings are employed. The outer edge of the rim is beveled, thereby facilitating the fitting



of a tight tire. The endless rings are reversible and permit the use of clincher or straight-sided type tires. No tools are required in connection with this rim. The rim is punched with ten holes beneath which there are a series of lugs attached to ten pieces of spring steel, which in turn are riveted to the inside of the rim. It is claimed that the internal pressure in the tire forces the outer rim against the lugs, thereby preventing these from moving while the tire is inflated. Upon deflating the tire it is possible to press the lugs back with the thumb and after these have been disengaged the outer rim can be removed from the tire.

Newmastic

The Newmastic rim, manufactured by the Newmastic Company, New York City, was one of the new things brought out at last year's show and was described in THE AUTOMOBILE at that time. It is of the no-felloe type, steel castings on the ends of the spokes directly supporting the rim, being secured to the latter by means of clamps controlled by means of bolts. The great decrease in weight due to the elimination of the felloe is one of the principal advantages claimed for this type of rim, another being that the wheel is automatically reset every time the rim is changed. Either quick detachable or clincher rim may be used. The Newmastic company is now getting ready a new design of rim, specially adapted for tires filled with Newmastic. The purpose of this new rim, which is of the demountable type, is to permit of varying the pressure in the filler. This end is obtained by constructing the rim of two sections or rings which are in wedge engagement with one another and which may be so positioned by manipulating a bolt mechanism that the width of the rim becomes variable. As the width is decreased, the tire filler is thereby put under increased pressure, and vice versa.

Presto

Presto demountable rims, manufactured by the Presto Inter Rim Company, of Boston, Mass., operate by simply pulling down a lever, which expands the locking ring and forces it off. The rim is made in all standard sizes and will fit all straight-side clincher or solid tires. A spare tire is carried upon a rim which fits over the permanent rim attached to the felloe band. In order to hold the demountable rim in position a split rim is employed which fits into a groove and by the aid of a toggle lever, the lugs at the points where the ring is split are drawn together or released, according to whether it is pushed up or down.

Stanweld

These rims are manufactured by the Standard Welding Company, of Cleveland, O., either in the quick detachable or

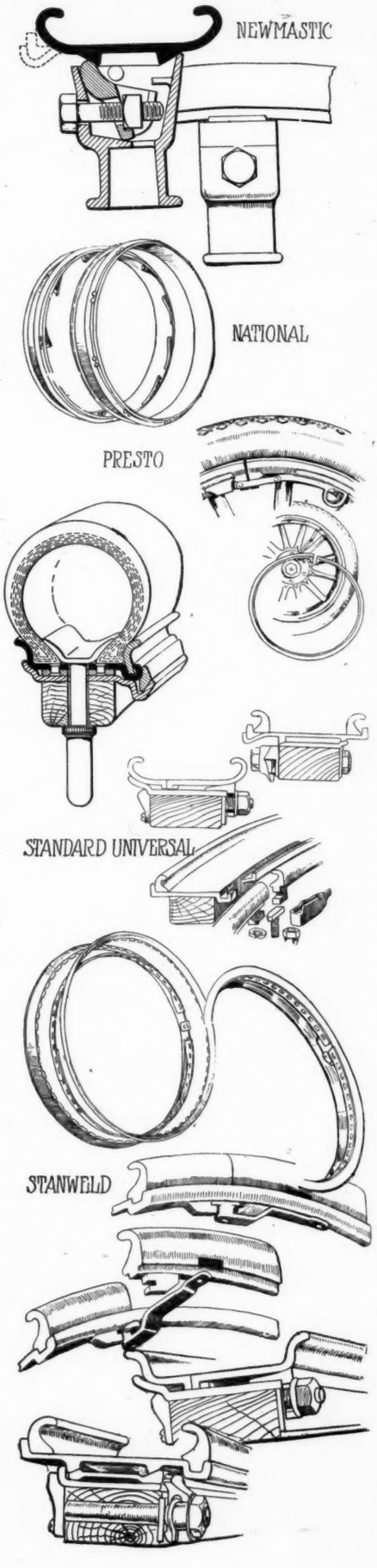
demountable types for wood or wire wheels. The principle on which the quick detachable operates is as follows: The body of the rim is permanently shrunk onto the wheel felloe and the latest type has two floating rings, having concave and convex sides, making it possible to use either straight-side or clincher tires. The inner side ring is endless, the outer side ring is split transversely and is tongued and grooved into the rim base. The ends on this ring have L-shaped lugs which protrude through holes made in the rim base. The lugs are locked by means of a cam which operates with a lever. The lever forms a latch and is made of spring steel; by removing the latch with the aid of a screw-driver the split ring can be pried off and the tire removed.

The demountable rim manufactured by this company consists of a rim the base of which is split circumferentially, each section having a series of lugs which are locked together by two semicircular slotted spring rings. One end of each ring is securely riveted to the wider section of the base and the free ends of both rings are locked by means of a swinging latch which in turn is securely fastened by a smaller cam latch. In order to remove a tire from the rim it suffices to press the catch back when the half locking rings can easily be pried away from the main body of the rim. The rim slides over a metal base which is shrunken to the felloe band and securely retained in position by six wedges giving radial and lateral support to the rim.

The number 40 Stanweld demountable rim is what is known as quick detachable demountable, it being possible to remove the tire without removing the entire rim as well as to remove the rim with the tire on it. The inner and outer ring can be made to serve for either the clincher or straight-bead type.

Standard Universal

Standard Universal rims are manufactured by the United Rim Company, of Akron, O., in both quick detachable and quick demountable forms. The body of the rim is shrunk permanently on to the felloe of the wheel. The inner ring is continuous. The front side ring is split transversely and is tongued and grooved to the rim body, the ends being held together by means of two L-shaped lugs, a cap and a tee-bolt, all notched into the rim, forming a positive lock. To protect the threads of the tee-bolt, an acorn nut is used in connection with it. The Number 3 quick detachable rim is split circumferentially and the two parts are held together by a series of bayonet hooks on one side with corresponding lugs on the other. In order to prevent rotary motion in opposite directions of the two parts a safety latch is provided and a special tool is used to lock and unlock the rims.



The quick detachable demountable type of rim consists of a felloe band shrunk permanently onto the wooden felloe of the wheel and has at each outer edge a concentric cone section or frustrum which gives continuous support to similar frustrums, on the inner surface of the rim body. The securing device consists of six rotary clamps so designed that two turns of each clamp nut automatically forces the rim home, centers it laterally and locks in position.

—

Changing to Demountables

Many automobilists who appreciate the convenience of carrying an inflated tire ready to place on the wheel at a moment's notice are changing to demountable rims. These represent not only those who are using the old form of clincher tire but also those who use the more modern quick-detachable rim. The cost of making the change is not very high and amounts generally to only $15 above the cost of the demountable rim.

When the wheelwright gets the order for the change he has to set about preparing a new felloe which will accommodate the demountable form of rim. The felloe for this style of wheel is thicker than the felloe used with the quick-detachable, and, in order to prepare a given diameter wheel for the thicker felloe the spokes have to be cut off all around. It is for this work that the charge is made.

The inflated tire is placed on the spare rim and carried in most cars on a rigid frame fastened to the rear of the chassis. In order to secure a stiff connection and to prevent the tire from wobbling and disturbing the steering of the car, the bracket used for holding the tires is made in a unit with the side frame members. In case of a blowout or other tire disaster it is not necessary to take the tire off the rim or to spend time in fitting on a new tire. The old rim with the damaged tire is simply slipped off and the rim with the inflated tire put in its place. The time of a tire change is reduced from 15 minutes or more, to 5 minutes.

The arduous labor of removing and repumping a tire even on the simplest form of quick-detachable rim will no doubt prompt many to make the change during the coming season. There are many who have wanted the demountable rim which has most of the good features of a spare wheel, but who have not known that it was not only a possible, but a very cheap job, to change over from one type to the other. On cars using smaller tires than the 34 by 4 inch, there is no doubt that the cost would be correspondingly less.

One of the worst features of oversize tires has been the difficulty of changing them. In the demountable rim, however, this work can be done in the garage and not on the roadside under a broiling sun or a pelting rain.

Among the New Books

Many New Technical Books of Interest To Motorists and Others—Good Fiction Also Available

Annual Report of the Smithsonian Institute Contains Many Contributions of Value to Science and Literature

WITH the approach of the delightful spring touring season, which in spite of muddy roads is always one of the most enjoyable of the year, the motorist who takes care of his own car is prone to devour what literature he can lay hands on before starting actual work in preparation for many miles of traveling through the budding country.

The following works which are at the disposal of those inclined to remain in the rocking chair fleet for just a little while longer embrace almost every field from the engineers' handbook to the fascinating fiction which uses the motor car as the basis of its plot.

ANNUAL REPORT OF THE BOARD OF REGENTS OF THE SMITHSONIAN INSTITUTION, showing the operation, expenditure and condition of the institution for the year ending June 30, 1911. Printed at the Government Printing Office, 1912.

This report contains the annual letter from secretary of the Smithsonian Institution, as well as that of the Board of Regents. An outline of the studies taken up through the year is given. A report of the different bureaus showing the progress of researches in the various arts and sciences is also given. Among the interesting papers contained in the report are: The Age of the Earth, Organic Evolution, and Traveling of High Speeds. The latter article being by Hele-Shaw should be of especial interest to automobile enthusiasts.

CHANGE GEAR DEVICES. By Oscar E. Perrigo. Published by the Locomotive Publishing Company, of London. 81 pages, 5 by 8 inches; illustrated by numerous explanatory line cuts. Price, $1.

This booklet deals with the change gear devices employed in driving a lathe or other cutting tool at speeds suitable for the work in hand. The early part of the work gives a history of lathes and lathe development and also a résumé of the more important change gear patents applied for in the early days of lathe history. Different methods are described in full and illustrated by simple diagrammatic drawings.

PETROL AIR GAS. By Henry O'Connor. Published by Crosby, Lockwood & Sons, London. Second edition. 100 pages, with numerous tables, illustrated by electrotypes. Price, 1 shilling, 6 pence.

This work consists of seven chapters and deals on the use of petrol or gasoline gas for lighting and cooking. It is useful from an automobile standpoint in that it gives valuable data on the combustion of gasoline gas, which has come into extensive use for country house lighting.

THE MECHANICAL WORLD POCKET DIARY AND YEAR BOOK FOR 1913. Published by Mechanical World, Emmott & Company, Ltd., 65 King street, Manchester, England. 530 3.5 by 6-inch pages. 6 pence net.

The primary aim of this work is to fill the gap which is bound to occur in the memory of the best of us after leaving college. Various formulæ and tables are given which will be of interest to all those concerned in mechanical engineering. A chapter on gas engines is of interest to those in this line of work. In this chapter are given the different formulæ for the design of crankshafts, bearings, flywheels, connecting-rods, etc.

TEXT-BOOK ON MOTOR CAR ENGINEERING, in two volumes. By A. Graham Clark. Published by D. Van Nostrand & Company, New York. 437 5 by 8.7-inch pages. Cloth, $3.

Taking up the principles and construction of the gas engine in the first four chapters of the book, the author proceeds to give an outline of the entire designing problem of the gasoline engine. The fifth and sixth chapters are devoted to fuels and carburetion, while the seventh chapter deals with thermodynamics of the gas engine. After concluding the general discussion on gas engines and the theories which are an important factor in the design of the gas engine, the author proceeds to take into consideration the construction of such essential parts as the magneto, control system, cooling system, brakes, bearings, etc. The final chapter is devoted to a study of the electric car, taking up especially the suspension of the motors, the construction of the various types of motor and the methods of controlling the various speeds.

THE GASOLINE MOTOR. By P. M. Heldt. Published by the Horseless Age Company, New York City. 506 5 by 8-inch pages; illustrated by more than 300 zinc etchings and several half-tones. Price, cloth, $4, with supplement.

This work is in twenty-one chapters and an appendix. The early chapters of the book are devoted to a theoretical discussion of the fuel and the cycle upon which the motor operates. A chapter is also given on the conversion of reciprocating into rotary motion. The balance of motors is also discussed at length. The remainder of the book is devoted to the design of each specific part of the automobile engine and is so arranged that the student may cover the ground at home or the designer may use the work for a handbook in the office. Another volume dealing with the chassis, etc., is to come soon.

FROM THE CAR BEHIND, by Eleanor M. Ingram. Published by the J. B. Lippincott Company, of Philadelphia. 306 pages, with illustrations in color by James Montgomery Flagg. Cloth, $1.50.

A delightful piece of fiction wound around an improbable plot. For summer reading it should be acceptable anywhere. The hero of the story is a wealthy young amateur racing driver who, through a combination of circumstances for which his cousin is really at fault, is forced to leave home in disgrace. At the end of the story, however, his vindication is complete and in the final triumph a very exciting cup race figures in which the Mercury, driven by the hero, Corrie Rose, proves the winner.

A TEXT-BOOK OF PHYSICS. Edited by A. Wilbur Duff; Contributed to by A. Wilbur Duff, E. Percival Lewis, Charles E. Mendenhall, Albert P. Carman, R. K. McClung and William Hallock. Published by P. Blakinston's Son & Company. 680 5 by 8-inch pages; illustrated by 600 line cuts. Cloth, $2.75.

As a text-book this work should be of great use where the more advanced study of physics is carried out. The book is divided into six sections. The first section of the book is given over to mechanics and the properties of matter, second to heat, third to electricity and magnetism, fourth to radioactive developments, fifth to sound and sixth to light. No new theories have been advanced in this work, which is a text-book in all senses of the word. The book is complete in all departments and forms an excellent basis of study to the subject taken up.

BEVEL GEAR TABLES. By D. Ag. Engstrom. Published by the Norman W. Henley Publishing Company, of New York. 65 5 by 8-inch pages of tables and explanatory matter. Price, $1.

The first few pages are given over to a discussion of tooth elements, for both circular and diametric pitches. Construction of bevel gears and a calculation are also given. The main tables, which take up thirty-seven pages, are devoted to the outside diameter, a placing distance outside cone radius, face angle, edge angle, cutting angle and number of cutter.

NATIONAL TUBE COMPANY'S BOOK OF STANDARDS. Published by the National Tube Company, Pittsburgh, Pa., under date of 1913. 558 4 by 7-inch pages. Price, in flexible leather binding, $2.

In this edition of the handbook, which is much larger than those issued by the National Tube Company, all the dimensions and data pertaining to tubular goods are given. A glossary of terms, which covers thirty-eight pages, is also given. The data secured in the work has been taken from reliable engineering sources and should be exact.

From the Manufacturer

Claim Internal Gears Are Superior to Outside Meshing Gears—Are Less Exposed to Breaking Strain

Magnetic Type of Controller Is Used on the Ohio Electric as Well as a Dynamic Brake

NEW YORK CITY—Editor THE AUTOMOBILE:—Recent announcements and demonstrations of the new Magic crescent sliding and poppet valve motor, designed by Martin Fischer, of Zurich, Switzerland, and the discussion of same at the recent meetings of the Society of Automobile Engineers, has caused much comment among automobile manufacturers and considerable interest is also being evidenced in the new Magic gear which will be used in conjunction with the motor. This is an internal gear and is a radical departure from the stereotyped change-speed gear.

Since its first try-out over 3 years ago it has proved an unqualified success, according to the makers.

The principal gear forming one piece with the driving shaft is on one end connected by a cardan joint with the clutch, and reposes at the other end in a square shifting block having large ball bearings. The high gear is obtained by the main driving pinion acting as a jaw clutch, no reduction gear wheels being in mesh, thus giving an ideal direct drive. The other speeds, first, second and third, are obtained by progressively bringing the main pinion directly into mesh with one of several internal gear rings with teeth cut conically, always having their center of generation in the cardan joint, thus doing away with the customary secondary shafts, the numerous gears usually employed, locking arrangements, springs, etc. In this way, this brings about the saving of at least 5 to 6 per cent. in general efficiency.

For the reverse drive, a small pinion is inserted between the main wheel and the internal gearing used for the first speed. The meshing of the main pinion with the internal gears is effected by shifting the end block on which there is a guide stud which moves in the grooves of a horizontal plate. This stud also takes up any side pressure from the teeth, preventing any lateral displacement of the main pinion. The shaft of the internal gear rings reposes on two large ball bearings, one of which is mounted over the direct drive, and the other exactly under the foot-brake thus securing always a gentle and noiseless braking effect, and insuring accuracy of mesh.

Superior efficiency of the internal gears over outside meshing gears is what is claimed for the gear. With the internal gearing, there are always more teeth in mesh, consequently each tooth has to transmit a smaller amount of power and is correspondingly less exposed to breaking strain; or, if desired, an equal strength can be obtained as compared with outside meshing gears by having smaller gears. For every speed below direct, only two gears are in mesh.—MOTOR AND GEAR IMPROVEMENT COMPANY.

Control lever of the Ohio electric

Control for Electric Pleasure Vehicles

TOLEDO, O.—Editor THE AUTOMOBILE:—Most motors on electric vehicles are series wound. There should be at least four speeds: two starting speeds, with resistance in the circuit; one running speed, with the fields in series; and one runnng speed with the fields in series parallel. If additional speeds are desired, each of the above running speeds may be modified by shunting. It is agreed among engineers that a constant voltage should be maintained instead of using low voltage for low speeds and high voltage for high speeds. The net efficiency is greater because the loss due to heat in the resistance on the starting speeds is not as great as the loss in the efficiency of the motor, due to low voltage. Batteries will get out of balance if run in parallel and various other complications ensue.

The most common type of controllers are of the drum type. The Ohio electric controller is of the magnetic type, by means of which small currents controlled by a little disk conveniently located on the steering lever, operate magnets, which in turn operate the large currents which drive the motor. General Electric contactors are used. This type of control is growing in popularity for certain types of street cars and large power plants, as it is very rugged and will last a life time without burning out.

Dynamic brakes are used on some cars. On the magnetic control of the Ohio electric, a dynamic brake is operated by a small button located in the controller, and the degree of braking is governed by a small mechanical governor. This will hold the car on the steepest hill, down to 3 miles an hour if desired, without using the pedals.—OHIO ELECTRIC CAR COMPANY.

Harking Back a Decade

FROM THE AUTOMOBILE of February 21, 1903:

The yelping, howling and barking of dogs, the cracking of rifles and ringing of bullets against metallic targets, the puffing and rattling of gasoline motors in operation and the pounding of carpenters' and decorators' hammers characterized in an aural way the opening of the second annual sporting goods, automobile and dog show of the Tri-State Sportsmen's Association now in full swing at the Detroit Light Guard Armory.

The good roads movement has a delightful breadth of scope, but great things move slowly. It is particularly puzzling how it can be arranged rationally to a national rather than a local issue, so long as the long haul is distinctly monopolized by the owners of the excellent long-distance roads, the railways.—Editorial.

There is a politician in Wisconsin who, for unknown reasons, has a grudge against the owners of automobiles, and has decided that the state needs a law pertaining to that class of vehicles. Assemblyman Moldenhauer, who is from the northern part of the state, on February 3 introduced in the assembly a bill providing that all owners of automobiles must obtain a state license, for which they must pay $1.

The Automobile

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Hail to Motor Spirit

THE automobile industry should give careful consideration to the new fuel, motor spirit, announced in THE AUTOMOBILE a week ago, not because this fuel is specially intended for passenger car use but rather because its use in traction engines, stationary engines, motor trucks and for scores of other purposes will take the drain of these departments off the gasoline field and so leave this field to the passenger car.

Motor spirit is not primarily intended for passenger cars, but rather for the above uses. Statistics from North Dakota and other large agricultural states show that in the agricultural seasons the traction engines consume six times more gasoline than automobiles, this being specially true during the threshing period. It is also true that stationary engines are large consumers. A motor truck operating nearly 8 hours per day uses vastly more fuel than a passenger car running but a few hours per day. Motor spirit is better for all of these fields than gasoline. Motor spirit is better because it costs approximately 3 cents per gallon less and in addition it gives 25 per cent. greater efficiency.

At present the pungent odor is the one suggested argument against the use of motor spirit for passenger automobiles. This is not serious, not nearly so serious as imagined, and it is a certainty that there will be thousands of users of passenger vehicles running on this fuel because of the reduced price and the greater efficiency. There is not the slightest reason why the odor of this fuel should be objectionable, excepting when spilled on cushions or floors, and only then because it is much slower to evaporate than standard gasoline.

The manufacture of the present fuel must be considered a great boon to the motor industry and if it never were used in a passenger car it will still do its work of preventing any great increase in the price of fuel. The recent increases in the fuel price, amounting to in all 50 per cent. within the last year, have led some buyers to give special consideration to whether they would purchase a six-cylinder car or not, owing to the added cost of operation.

The National Shows

TWO or three automobile makers have been denouncing the national automobile shows held annually at New York and Chicago on the ground that they have outlived their usefulness and that to-day they are unnecessary expenses, in that the makers pay for approximately 60 per cent. of the attendance and that they are forced to expend enormous sums in daily advertising which could be expended to much greater advantage at other periods of the year.

On the face of it these two reasons for discontinuing shows appear inadequate as they are conditions that can be corrected by the makers themselves with scarcely any difficulty. The manufacturers make their advertising appropriations and it rests entirely with them how they should expend such appropriations and when; the purchasing of admission tickets to the shows for distribution among prospective buyers also rests with them.

The two national shows have played a wonderful part in the building up of the industry to-date and their discontinuance would be an injury at the present time. There is not any reason why shows cannot be continued for at least 5 years yet. The French industry imagined it could do without its annual show. It was discontinued for a year and the makers lost out so deplorably that there was a general call-together for the show. What is true in France is true in America, in spite of the fact that conditions are different in the two countries.

The fault with many manufacturers lies in themselves. They do not prepare for the show. They go into it in an expensive unprepared fashion and come home with barren regrets. The value of the show to the maker depends on the energies and preparedness with which the maker goes into it. A company generally gets from a show what it goes after. Those concerns not drafting out definite policies and perfecting plans will naturally reap regrets and they deserve to. The other concern that plans its show campaigns as carefully as its new season model, makes every preparation in advance; goes after its business systematically; drafts a complete show program and lives up to it; and, in a word, makes the show a value rather than going passively, looking for disappointments and receiving them in wholesale quantities.

Motor Fuel Engages Attention of Indiana S. A. E.

INDIANAPOLIS, Ind., Feb. 24.—One of the most interesting meetings the Indiana branch of the Society of Automobile Engineers has held in many months was that at the Claypool Hotel in this city last Tuesday night. There was a large attendance and the subject was Motor Fuel. The principal speaker was John A. Secor, expert with the M. Rumely Company, Laporte, Ind., manufacturers of an oil tractor.

William G. Wall of the National Motor Vehicle Company arranged the program and to him is due the credit of obtaining Mr. Secor to address the meeting. Mr. Secor's subject was Kerosene Engines, and he spoke in part as follows:

The power-driven vehicle can no longer depend on its present fuel. The demand for gasoline has overtaken production. During the last decade the oil market has been readjusting itself to radically new conditions. This has been brought about by many new applications of oil products for developing heat and power. Crude oil was formerly looked upon simply as the raw material for the production of illuminating and lubricating oils.

The introduction of the Daimler motor opened up an entirely new market for the lighter oils, gasoline and naptha, which developed within the short period of 10 years into larger proportions than the most optimistic oil man ever dreamed of. Under these conditions the inexorable law of supply and demand brought about a price level for the volatile distillates far in excess of former values.

Advance Due to Inevitable Law

United States government reports show that the advancing price of gasoline is due solely to the laws of supply and demand. No corporation or combination of corporations is responsible for the fact that demand has overtaken production, and that further increases in price are now impending.

American gasoline and naptha were formerly obtained solely from high grade paraffine crudes of Pennsylvania and Ohio. These are the most valuable oils in the world, and highest grade Pennsylvania crude now actually brings the same price as refined kerosene in bulk.

But unfortunately Pennsylvania production has fallen from 33,000,000 barrels in 1891 to about 9,000,000 barrels at the present time. However, at present prices even this decreased production represents over $18,000,000.

Ohio has decreased in production from 24,000,000 barrels in 1896 to less than 9,000,000 barrels during the year last past.

Again, the zenith production of Indiana was in 1904 over 11,000,000 barrels but the present yield shows a shrinkage of nearly 90 per cent. from maximum.

The United States Geological Survey states that the general decline in production "would doubtless have been much greater but for the effort to apply laws of supply and demand by increases in prices. Prices advanced so greatly during the year as to stimulate drilling, even in the old New York and Pennsylvania pools, and so checked the decline. Formerly this plan has not been so successful. In the mid-continent fields also it checked the decline, so that the product will come within 4,000,000 barrels of the maximum output.

Canada also has fallen off one-third from her highest production of 5 years ago, and the only new field in sight is Tampico, in Mexico, which has grown from nothing 3 years ago to 6,000,000 barrels in 1912.

About the only home fields not showing decreased output are in California and Oklahoma. Three-fifths of the total yield now comes from these two states. And even the increased output of Oklahoma was insufficient to prevent a continuous reduction of stock on hand in 1912. Ninety per cent. of the entire output of more than 220,000,000 barrels were crudes which yield a very low percentage of gasoline.

The following market prices of Eastern, Mid-Continent and Western crudes are fairly indicative of their relative gasoline content:

State	Per Barrel
Pennsylvania	$2.05
Indiana	1.23
Oklahoma and Kansas	.83
California	.35

These prices of crude oil were correct as of January 25, 1913. Since that time Pennsylvania crude oil advanced 7 cents a barrel on each of 3 successive days, standing now at $2.50, and $3 oil is freely predicted.

In order to obtain a single gallon of gasoline from refinable California petroleum, it is necessary to produce as by-products 9 gallons of kerosene and 30 gallons of residual oils. Notwithstanding the steadily increasing output of Western oil the price of gasoline on the coast continues to advance. It is now 30 cents per gallon at retail.

There are five different methods of increasing the normal visible supply of gasoline.

One is importation. The Standard Oil Company has imported some Russian naptha, but Russia has no more to spare, as her own soil output is diminishing to such an extent as to increase the price 100 per cent. in the last 2 years, and to warrant the Russian Government in the promotion of alcohol production.

Another and more promising means of obtaining gasoline is by increasing the total yield of American crudes. A yearly production of 300,000,000 barrels in the United States is probably being approached faster than even oil men generally believe. But the largest increase in the production of gasoline in one year has never been more than 5 per cent. while the production of power-driven vehicles will, in all probabilities, represent an increase this year of around 100 per cent. Furthermore, as already shown, the supply of gasoline yielding crudes is rapidly decreasing and the increased crude output will consist of Oklahoma and California asphalt oils, having insufficient gasoline for existing requirements.

The third means of supplementing the gasoline supply is the production of gasoline from kerosene. Chemists have known for some time that it was entirely feasible to extract gasoline from the chemically complex kerosene; as well as from coal, coal tar and even wood; it is simply a question of cost and of the profitable disposal of resultant by-products. Gasoline is now being made from kerosene in increasing quantities.

A fourth source of gasoline supply is its manufacture from natural gas by compression, and its subsequent condensation to a liquid form. It is claimed that this process produced 13,000 gallons in 1910, which was increased to 50,000 gallons in 1911 and about twice as much in 1912. Some of the richer gases produce as much as 8 gallons per 1,000 cubic feet but the average is from 3 to 5.5 gallons. By triple and quadruple compression up to pressures as high as 400 pounds, very light liquids up to 85 degrees Beaumé are produced, these being slightly more stable than the products of fractional distillation.

Lowering the Beaume Gravity

The fifth and last means of increasing the available gasoline supply is by lowering its Beaumé gravity. It is probable that the specific gravity of commercial gasoline will be dropped another notch by next summer. Much of the liquined-gas gasoline is used for blending with heavier distillates, and it naturally requires other than gravity tests to determine the characteristics of such blended gasolines.

Mexico a Source of Fuel

During 1912 Mexican Oil Fields Produced 15,200,000 Barrels of Oil—One-Sixth Available Output

TAMPICO, MEX., Feb. 24.—In view of the enormous increase in the consumption of gasoline as a result of the automobile industry and the general development of the uses to which gasoline engines are being put, a review of the possible sources of supply of the crude oil is probably of interest at this time.

Much of the Mexico oil is not of a refining grade, but it is a fact that at least three of the greatest producing fields in the Tampico region are now gushing forth oil of 20.5 degrees Baumé and that the oil of another one of the fields is 28 degree Baumé, while that of the Isthmus of Tehauntepec is 40 degree Baumé. All of these are oils that can be refined.

Only Part of Possible Production

During the year 1912 the Mexico fields produced approximately 15,200,000 barrels of oil, which was about one-sixth of the available output of the wells. This production may be regarded as remarkable in view of the fact that the transportation and marketing facilities are as yet very limited and the known oil-producing territory in a comparatively small state of development. The production for the year was confined practically to two of the larger companies and their allied interests. These are the Mexican Petroleum Company and its subsidiary, the Hausteca Petroleum Company, and what is known as the Pearson interests, comprising the English firm of S. Pearson & Son, Ltd., and the Mexican Eagle Oil Company. While there are more than forty companies, firms and individuals now operating in the East coast territory situated within a range of 160 miles of the port of Tampico, only a few of these concerns are on a producing basis so far as the actual marketing of their product is concerned. While the output of the different fields in the Tampico region for 1912 aggregated approximately 15,200,000 barrels, this production only represents a comparatively small part of what is now available.

It is claimed that there are enough producing wells capped, owing to the fact that there is not at this time a means of transporting the oil to market, to have brought up the yield for the year to perhaps six times what it was. In proof of this statement it may be cited that two of the wells which afforded, during the year, the bulk of the total yield were only permitted to flow a small portion of their capacity and that had these two wells alone been thrown wide open they would have given a total output aggregating, it is said, probably fully 90,000,000 barrels of oil. Of course, this is not taking into consideration the possibility that their flow might have been exhausted had this been done. One of these wells is that of the Mexican Eagle Oil Company situated in the Potrero del Llano field, State of Vera Cruz. While it has a proved flow of 110,000 barrels per day, it was kept throttled down during the year to a production of only about 15,000 barrels per day and difficulty was experienced in taking care of this quantity of the fluid. The other phenomenal well is that of the Hausteca Petroleum Company situated in the Juan Casiano district and having an available daily output of about 100,000 barrels, it is claimed, but which was held down to a flow of 28,500 barrels daily. This latter well has been flowing at that rate for nearly 3 years without a single day of interruption.

In the Juan Casiano field the Hausteca Petroleum Company has eight capped wells which have an aggregate capacity, it is pronounced, of more than 16,000 barrels daily. It is now drilling several other wells in that field. This company and the Mexican Petroleum Company had in storage on January 1, 1913, approximately 7,000,000 barrels of oil. Their contracts during 1912 called for a daily delivery of 30,000 barrels and the two companies entered the new year with outstanding contracts aggregating 60,000,000 barerls, of which 35,000,000 barrels are for consumption in Mexico and 25,000,000 barrels for consumption in the United States. The average selling price of the product is 50 cents gold per barrel. During 1912 the sales of these two companies were approximately 8,700,000 barrels, or about 700,000 barrels per month. This is just double the sales of the two companies for the year 1911.

The Mexican Petroleum Company is having constructed and will place in service during the first 6 months of 1913 six oil-tank steamers, two tugs, two barges and other floating equipment. The cost of providing this fleet of oil-carrying vessels, which will have an aggregate capacity of about 275,000 barrels, will be about $2,000,000. The company has also adopted plans for erecting a refinery at Tampico for the production of naphtha and light gasoline distillate at a cost of about $300,000.

During the year 1912 the Hausteca Petroleum Company completed the construction of an additional oil pipe line from Juan Casiano to the loading racks at its deepwater shipping point. It also finished the construction of a private narrow-gauge railroad giving the oil field a transportation outlet of this character. It is now constructing a railroad from Cerro San Geronimo to Cerro Azul, and is laying pipe lines from Juan Casiano to Cerro Azul and to Tres Hermanos.

The Mexican Petroleum Company was also active during the year in exploiting other localities and it carried on some small development work in its original field at Ebano, where it has a small refining plant that is devoted chiefly to the production of asphaltum residue that is used largely in street paving in Mexico.

The Pearson interests brought in eight wells in the Potrero del Llano field during the year, but they are all, with the exception of the so-called 110,000-barrel gusher, tightly capped pending the establishment of additional transportation facilities.

The Mexican Eagle Oil Company has also contracted for a large fleet of oil-carrying vessels and will place it in service during the present year.

Next to the Potrero del Llano and the Juan Casiano fields the most activity during the year was in the Panuco and Topila fields, which are situated adjacent to the Panuco River, a short distance above Tampico. In these two last-named fields the East Coast Oil Company, which is owned by the Southern Pacific Railway interests, led in development operations. It has a number of producing wells in those two fields and they are connected with loading racks on the Panuco River by means of pipe lines.

300,000 Acres Added in 1912

The Texas Company, which has its headquarters at Houston, Tex., the Gulf Refining Company and several other of the large oil-producing and pipe line concerns of the United States acquired oil land holdings in different districts around Tampico during the year and are actively engaged in the preliminary exploitation of same. Some of these companies have already established lines of vessels between Tampico and ports in the United States and are engaged in the regular business of transporting the crude oil to those foreign markets.

There was added approximately 300,000 acres to the oil-producing territory in the Tampico region during the year 1912. The gravity of the oil of the different fields is as follows:

Ebano, 11 degrees, Baumé; Panuco, 12.5; Caracol 12.5; Topila, 15; Juan Casiano, 20.5; Potrero del Llano, 20.5; Tanghuijo, 20.5; Furbero, 28; Isthmus of Tehauntepec, 40.

Shipments of oil during the closing months of 1912 from all the oil fields were at the rate of about 1,500,000 barrels per month.

The Mexican Eagle Oil Company is now shipping oil through the port of Tuxpam at the rate of about 600,000 barrels per month.

200,000 Cars Per Year

N. A. Hawkins, General Sales Manager of the Ford Motor Company, Tells The Company's Story

DETROIT, MICH., Feb. 21—Just what it means to manufacture 200,000 complete automobiles in 12 months was told by N. A. Hawkins, general sales manager of the Ford Motor Company, at the dinner of the Adcraft Club and the Board of Commerce at the Cadillac Hotel last night. In a story bristling with big figures and full of the romance of business Mr. Hawkins touched upon the marvelous growth of the Ford plant from a pigmy to a giant. Ten years ago the company was capitalized at $28,000 and did an annual business of $200,000. Today it is the largest automobile factory in the world; has a capitalization of $30,000,000 and sells annually $200,000,000 worth of automobiles in all parts of the world.

"Ford profits," said Mr. Hawkins, "are equivalent to maximum industrial earnings on a capitalization of $200,000,000 and on this basis could probably, before its twentieth anniversary, return the equivalent of this amount to its shareholders. The January sales of Ford cars were nearly $9,000,000 or more than twice the gross receipts of the Grand Trunk railway system for the same month. In the last four months we did a business of nearly $30,000,000 and 2 of those 4 months were not very good ones.

Highly Efficient Organization

"The Ford company has all the elements of a successful enterprise. It manufactures a useful article; its company is properly organized; it is amply financed, entirely within itself, to successfully carry on its operations; its business policy is clear and well defined; its management is capable, tactful and honest; its factory is well designed, fully equipped and suitably located; its product is perfect in design and quality; its selling force is efficient, the largest of its kind in the world, and backed by plain, honest advertising, with complete service to owners.

"The Ford is an organization of all young men. Not an executive head has been added to a single department of the business in more than 6 years, during which period the output of cars and annual sales have nearly doubled each year. All this great business has been built up from an original cash capital of only $28,000 and without ever borrowing a dollar or issuing any paper. We used banks only as depositories to lock up money and earn interest, and this season in planning a production of 200,000 cars we never consulted with a banker.

"We are at present employing in our factories and at our branch houses 18,061 men, and all day workers, not a piece worker in the plants, and disbursing monthly about $700,000 for payrolls. Every day, except Saturday, is pay day, and our average runs between $30,000 and $35,000 daily.

"Our factory, which now covers practically 65 acres, is about as complete and up-to-the-minute as modern architecture and latest machinery and labor-saving appliances can make it.

"Our going inventories of raw materials, parts, accessories, etc., are running along now at an average of about $7,000,000, and, mind you, every car that we build each day is shipped the same day, so none of this amount is for finished cars. Our total net assets are close to $25,000,000.

"June 24 last a schedule of manufacturing our 1913 output was decided upon. To handle this production we require 1,000,000 lamps, 800,000 wheels, 800,000 tires, 90,000 tons of steel, the hides of 400,000 cattle to furnish the leather for upholstering the bodies, the hair or bristles from 6,000,000 hogs to stuff into the upholstering, 12,000,000 hickory billets for wheel spokes, nearly 2,000,000 square feet of glass for the windshields, 750,000 pounds of soft soap, 15,000 tons of molding sand to make our castings, 2,000,000 cubic feet of gas per day for heat-treating, etc.

"January 13 last we built and shipped 1,336 finished model T's—a business for one day amounting to nearly $700,000 and requiring more than 200 freight cars to handle the shipments, or five full train loads of more than forty cars to the train.

"On the basis of the mileage from Detroit to New York City—if we had delivered this day's output to our New York branch by driving the cars overland, we would have had a procession of model T's—just a half a mile apart—and when the first car was coming into New York the last one would be leaving the factory.

"During January we built and shipped 17,601 finished cars—a net volume in dollars and cents of nearly $9,000,000—more cars than we built and shipped during the first 5 months of last season. By the end of February the close of our first 5 months for 1913—we will have shipped more than 56,000 cars as against 17,555 for the same period a year ago.

"In spite of our increased facilities for producing, our daily orders are in excess of our daily output as evidenced by the fact that in spite of all the great shipments we have made we still have on file for immediate attention 38,326 orders or a sufficient quantity to take us through to April 10, at the rate of 1,000 cars a day.

"Our traffic manager recently advised that we would require 35,000 freight cars to move our 1913 output.

"According to our output this season and according to the most authentic estimates of other car makers, we will produce every other car that is built in this country during 1913.

"One day last week we gave one tire concern our check for a little less than $2,000,000 and every other single part that goes into the construction of our cars bears a similar comparison to the completed job—from cotter pins and lamps to springs and tops—so that you can get some idea of quantity production.

"By September 30 we hope to have at least 400,000 satisfied users voicing our sentiments. Four hundred thousand Ford owners means 400,000 voters for good roads, because most Ford owners are their own drivers—and when good roads are linked up all over the country, I hate to think about our annual production to supply the demand for these individual Ford transportation lines.

"The great demand for Ford cars has not been brought about without a fair amount of advertising and careful study of the selling problems."

Cost of Fire Chief's Runabout

YONKERS, N. Y., Feb. 21—The Yonkers fire chief and the 1st and 2nd assistant chiefs, or deputies, have been given three 4-cylinder, 28-30 horsepower gasoline runabouts, equipped with electric cranking, electric lights, electric horn, fire gong, buggy-top, etc. These were installed in October, 1912, and since that time enough data have been gathered to warrant a comparison between the horse and the automobile in this particular capacity.

First assistant Chief Baker furnished the following data to a representative of THE AUTOMOBILE. The figures are arranged in tabular form below. As may be seen, the result in actual cash saving per month, speaks well for the automobile.

MONTHLY SAVING ON CHIEF'S RIG-HORSE VS. MOTOR

HORSE		MOTOR	
Feed	$.33 per day	Gasoline	$.17 per day
Shoeing	.26 per day	Oil	.05
		Grease	.03
Total	.59		
Total motor	.25	Total	$.25
$.34. daily saving		$.34 daily saving	
		30 days	
		$10.20	
		Saving per month	

Gasoline....$.17 per gal., 1 gal per day
Oil..... .60 per gal., 2 gal per month
Grease..... .15 per pound, 3 oz. per day

Two other points in favor of the machine, mentioned by Chief Baker, are first: the hill climbing power of the runabouts. In a city having the seven hills of Rome, the value of this point cannot be over estimated. The second point is the speed with which they enable the executive to reach the scene of the fire.

Schermack Spring Wheel Acts on New Principle

Road Shocks Are Absorbed By Lateral Movement of Flat Steel Springs Held Under Tension and Oppositely Aligned—Vibration Absorbing Qualities Tested By Schermack Resiliograph

AN entirely new spring wheel design is that of the Schermack resilient wheel, the general construction of which is shown in Figs. 1 and 2. This new type of spring wheel consists of a hub section or inner wheel A, and a rim section or outer wheel B. The latter carries a standard rim on which a solid rubber tire is mounted. The two sections are provided circumferentially with aligned projecting flat steel springs or brackets C, bolted with two bolts each on alternately opposite sides of the two rims A and B. These springs are mounted in such a manner that each spring on one rim is under tension and is oppositely aligned with one on the other rim and on the opposite side thereof. These flat radial springs C acting horizontally are connected in pairs to the outer and inner rims by laterally-arranged steel bars or bolts D, the ends of which are provided with steel balls working in socket connections E, which are fixed to the flat springs C. These cross bars, together with their ball and socket connections, take up throughout the circumference of the wheel any load either vertically or sidewise which may be placed upon them. It follows from the construction of the wheel that side loads are more easily carried than vertical loads, since the lateral strength of the wheel is seen to be greater than the vertical.

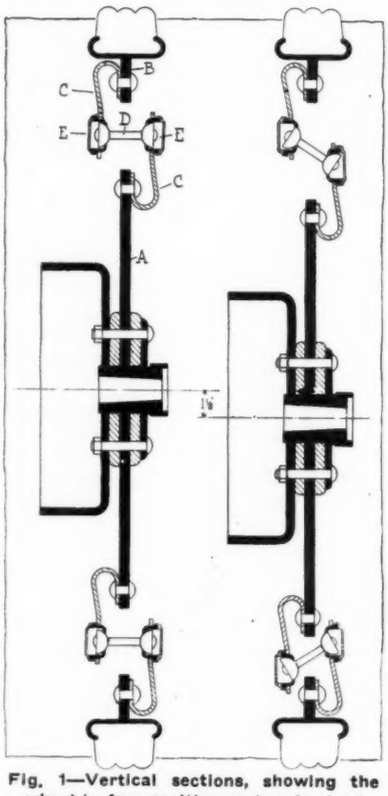


Fig. 1—Vertical sections, showing the wheel in free position and under load

The principle of the Schermack wheel may be gained from inspection of the two sections in Fig. 1. That on the left shows the normal condition of the device when no vertical load is applied to the hub. It will be seen that the bar connections D are horizontal when the wheel is in its normal position, and that when under load they are inclined throughout the circumference of the wheel, as shown in the right hand section. When under load the bars work up or down, depending on their temporary location as referred to the road surface. Under load the horizontal distance between the bar ends is less, since any inclined line is greater than the perpendicular distance between the vertical planes of these bar ends. It is therefore evident that any motion of the ends of the bars means a horizontal pull on the flat springs and their consequent bending in.

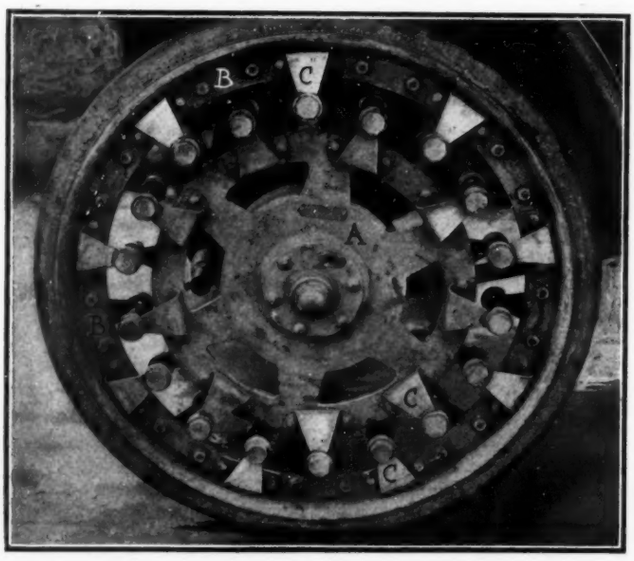


Fig. 2—View of the Schermack spring wheel fitted to car, showing how the flat steel springs are disposed

The ball and socket joints which are packed with grease are used for preventing the bars D from being cramped or from having any other pull acting upon them except that in the direction of their axes. The springs C are designed to be under tension even when there is no load upon the wheel, and they have sufficient strength to react under any imposed stress.

It will be seen that when there is a starting load imposed upon the wheel there is a tendency for the inner wheel to revolve within the outer portion. But since the connected springs C are mounted alternately on the two portions of the complete wheel, it is evident that when the inner wheel is revolved, one bar pulls in one direction while the next one pulls in the opposite direction. Thus each two pairs of interconnected springs pull against one another, nullifying their action and causing the outer and inner wheels to move together, with only a slight give, much the same as that of a wire wheel construction under the same conditions.

A feature of the Schermack construction which is commendable is that the flat springs C are always under tension. There is, therefore, no possibility of any rattle of the parts or of their working loose under ordinary conditions of travel. Further, the construction makes it impossible for any spring or set of springs to carry more of a load than any other set. There are eighteen sets of springs around the circumference of a wheel, hence each set carries .055 of the total load under all sorts of circumstances.

The Resiliograph

For the purpose of proving that its steel spring wheels when equipped with solid rubber tires have the proper vibration absorbing qualities the

Schermack Wheel Company has devised an ingenious apparatus which is called the resiliograph, and which is shown in Fig. 5. Fig. 3 also gives a view of the device, as attached to a motor car equipped with the Schermack wheels.

It has already been explained that the Schermack wheel consists of two circular sections, an inner wheel attached to the hub and an outer one which carries the rim and tire. It is evident that when revolved without load in some way (by jacking up the wheel) the two sections have a common center. But when a load is applied, the center of the inner member drops below the normal center, which is the true center of the outer wheel and which is always fixed. The actual working or live center of the wheel being the center of the inner wheel, it fluctuates continually in relation to the true or dead center of the outer wheel, as already mentioned, in an amount in proportion to the car's weight, or as the roadbed varies.

This is what the resiliograph was designed to do. A cross bar CB, Fig. 5, is attached to the outer rim of the wheel, as shown in Fig. 3, bolting to it at N_1 and N_2. This bar has a bearing at its center, which bearing is also at the exact or dead center of the wheel. This bar supports the sleeve end of the long bar S, the front end of which is supported on the running board in a spring buffer. See Fig. 3. This bar S carries the two drums X and Y on which the paper record is made by means of the pencils shown. When the wheel revolves, the cross bar CB also revolves, but the bar S remains stationary, it, together with the recording mechanism, being in fixed relation to the dead center of the wheel. The bar CB in turning drives the integral pulley V, a belt from which passes the motion to P_1. Another belt from the shaft of P_1 conveys the power to pulley P_2, which is on the shaft of the driving drum X. Thus, the revolution of the wheel causes the paper to move horizontally from one drum to the other.

A shaft passing through the sleeve V attaches to a short lever V_1 on the inside of the wheel. To this lever, an arm W is pivoted as shown. This arm is slotted at its lower end to receive a pin which is fixed in the center of the hub. This pin, which is also in the exact center of the inner portion of the wheel, represents the live working center of the wheel, and it is continually moving up and down, as explained above. Its movements are transferred to the slotted end of arm W, which in turn transfers them to the other end of the shaft and to arm W_1 on the outside of bar S. Arm W_1 connects with the recording pencil through the rod R. It is now seen that when the wheel revolves the drum X winds up the paper, while the pencil traces the vertical movements of the inner portion of the wheel. The pencil Z is stationary and is used to trace the dead center of the wheel, which point becomes a horizontal line when drawn out, and which can be used as a reference line or base line.

By the use of the instrument, many interesting diagrams showing the fluctuations of the inner portion of the wheel under various road conditions have been taken, appearing as shown in Fig. 4. These indicate that the wheel absorbs jars, shocks and vibrations in much the same way as does the pneumatic tire.

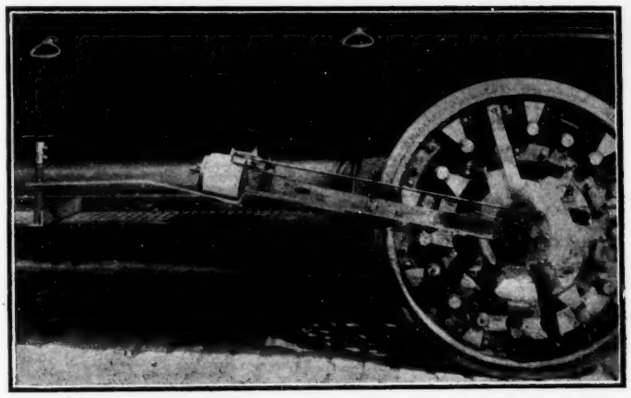


Fig. 3—Schermack resiliograph in position for testing the vibration absorbing properties of spring wheel

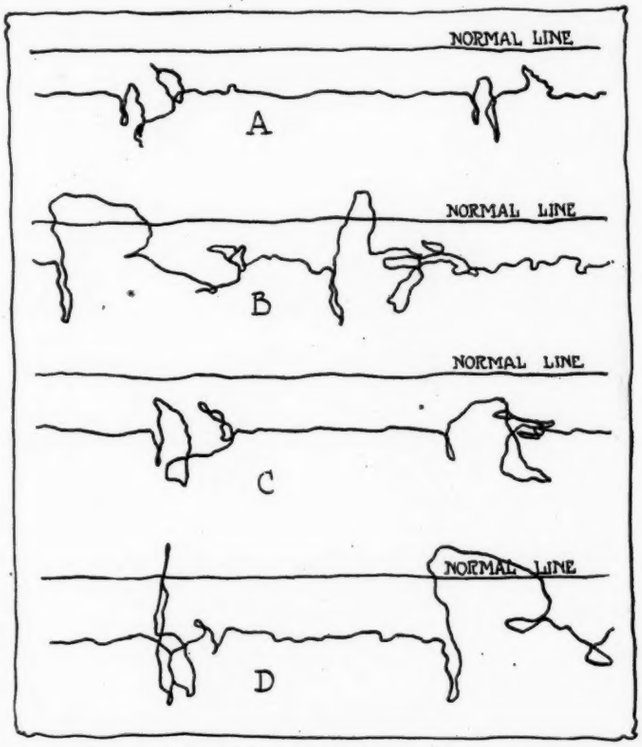


Fig. 4—Series of test charts obtained by the use of the resiliograph, under the following conditions:

A and B—Empty car over 1 inch blocks 12 feet apart at speeds of 8 and 15 miles per hour respectively

C and D—Loaded car over 1 inch blocks 12 feet apart at speeds of 8 and 15 miles per hour respectively

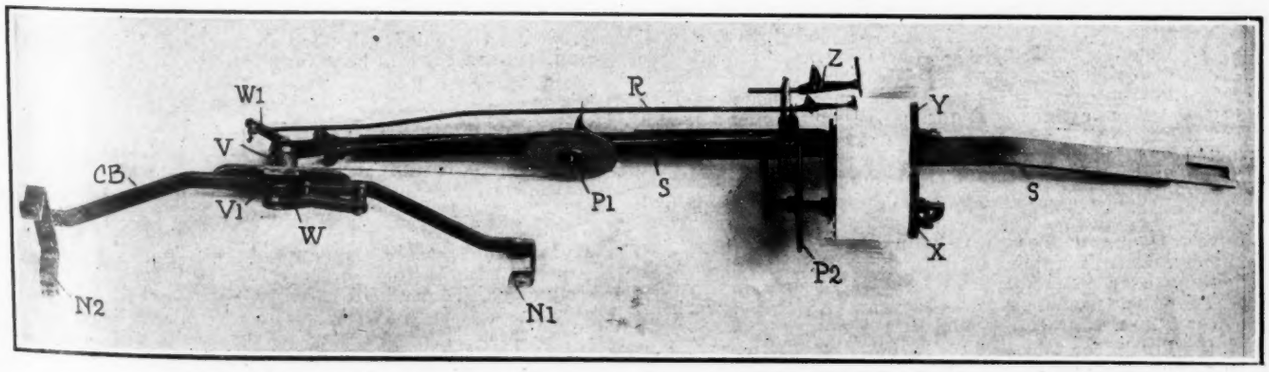
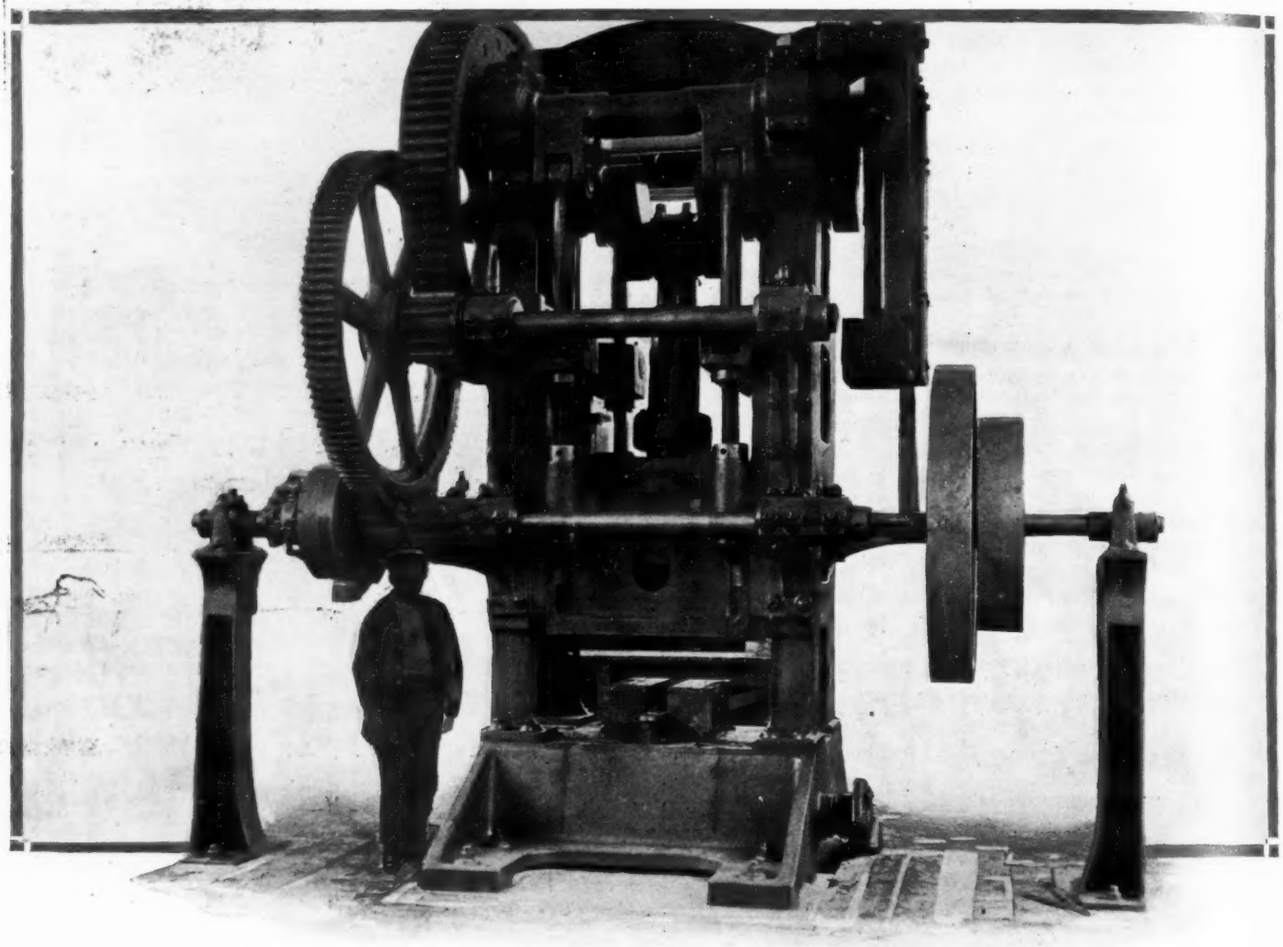


Fig. 5—Detail of Schermack resiliograph showing pencils and strip of paper on which the records are taken

Factory Miscellany



Largest power press in the factory of the Ford Motor Company, Detroit, Mich. It is used in making magneto coil supports

THE machine shown herewith is used in the manufacture of the magneto coil support for Ford cars. The Ford magneto is housed within the flywheel, and is of peculiar shape and heavy design. The services of this huge die are required in its manufacture. As may be seen in the illustration, the machine is more than 2.5 times the height of a man of ordinary stature and is about as long as it is high. The instrument converts rotating into reciprocating motion of a heavy crank and connecting-rod. The lower end of the connecting-rod holds the hammer which acts upon guides in the same manner that the piston in the motor cylinder is actuated. As may be seen, drive is by means of heavy gear wheels and a horizontal shaft which is carried by bearings supported on two posts which render the shafting independent of hammering shocks. This power press is the largest employed in the Ford factory and is one of the main factors in the quantity production scheme of this concern. It is said that one Ford car passes through the assembly department of the plant every fifty seconds and it is by the aid of such machines as these that the speed of the output is maintained.

OVERLAND'S Building Plans—The Willys-Overland Company, Toledo, O., is arranging for the erection of a new five-story administration and general office building in that city at an approximate cost of $150,000. Specifications call for a five-story building with basement 200 feet by 80 feet in dimensions. It will be constructed of brick, steel and hollow tile and will be fireproof throughout. Another small factory addition is soon to be made at a cost of $2,500, a permit having already been issued for the work.

Ford's Mammoth Boston Building—The Ford Motor Car Company, Detroit, Mich., intends to erect a building with something over 100,000 square feet of floor area in Boston, Mass., for the assembling of its cars, and will begin work in the near future.

Motor Trucks for Maxwell—It is rumored that the Maxwell Motor Car Company, Detroit, Mich., has put out some tentative inquiries in New York City for machine tools to be used in refitting the old Brush plant in Detroit. It is understood commercial trucks will be manufactured.

New Plant for Batavia—The Baker Gun & Forging Company, Batavia, N. Y., recently entered into a contract by which the Jamesville Manufacturing Company's business will be brought to that city. It is expected that plans will be considered for the removal of the Jamesville plant to Batavia and provisions for the big changes in the present plant are now under discussion. The Baker concern manufactures automobile electric starters as well as guns.

Nyberg to Increase Capacity—At the annual meeting of the board of directors of the Nyberg Automobile Works, Chattanooga, Tenn., held recently, plans were made to increase the capacity of the plant to meet the demand for the Nyberg cars. It is probable that a new site will be selected and new buildings erected. Another decision was made at the meeting, this being to manufacture in the future nothing but high-grade, six-cylindered cars.

The Automobile Calendar

Shows, Conventions, Etc.

Feb. 24-27.....Kansas City, Mo., Truck Show.
Feb. 22-Mar. 1.....Brooklyn, N. Y., Annual Show, 23rd Regiment Armory.
Feb. 24-Mar. 1.....St. Louis, Mo., Annual Show.
Feb. 24-Mar. 1.....Memphis, Tenn., Annual Show.
Feb. 24-Mar. 1.....Omaha, Neb., Annual Automobile Show.
Feb. 24-Mar. 1.....Paterson, N. J., Annual Show, Paterson Automobile Trade Association.
Feb. 24-Mar. 5.....Cincinnati, O., Annual Show, Music Hall, Cincinnati Automobile Dealers' Association.
Feb. 25-28.....Eau Claire, Wis., Annual Show, Armory, Dealers' Association.
Feb. 25-Mar. 1.....Syracuse, N. Y., Annual Show, Syracuse A. D. A.
Feb. 26-Mar. 1.....Fort Dodge, Ia., Annual Show.
Feb. 26-Mar. 1.....Glens Falls, N. Y., Automobile Show, Louis Blumenstein, Manager.
Feb. 27-Mar. 1.....Toronto, Ont., Annual Show, Toronto Automobile Trade Association.
March.....Indianapolis, Ind., Spring Automobile Show, State Fair Grounds, Indianapolis Automobile Trade Association.
March.....Nashville, Tenn., Annual Show, Nashville Automobile Dealers' Association.
March.....Pittsburgh, Pa., Annual Automobile Show.
March 3-8.....Bridgeport, Conn., Show, Park City Rink, B. B. Steiber.
March 3-8.....Denver, Col., Annual Show, Municipal Auditorium.
March 3-8.....Springfield, Mass., Automobile Show, New Auditorium Building, United Amusement Company.
March 3-18.....Des Moines, Ia., Annual Show, Pleasure Car Section, Coliseum, Dealers' Association.
March 5-8.....Tiffin, O., Annual Show, Tiffin *Daily Advertiser*.
March 5-8.....Louisville, Ky., Annual Show, Dealers' Association.
March 5-8.....London, Ont., Annual Show, Drill Hall, Louis Blumenstein.
March 8-15.....Boston, Mass., Annual Automobile Show.
March 8-15.....Columbus, O., Annual Show, Billy Sunday Tabernacle, Automobile Club and Traders' Association.
March 10-15.....Columbus, O., Opening Week, Columbus Automobile Trades Association.
March 11-15.....Buffalo, N. Y., Commercial Vehicle Show, Auditorium, Automobile Dealers' Association.
March 12-15.....Ogdensburg, N. Y., Automobile Show, Louis Blumenstein, Manager.
March 17-22.....Norfolk, Va., Annual Show, Armory Building, Norfolk Automobile Trade Association, Inc.
March 19-26.....Boston, Mass., Annual Truck Show.
March 20-24.....New Orleans, La., Annual Show, N. O. A. D. A.
March 24-29.....Indianapolis, Ind., Annual Automobile Show.
April 1-6.....San Francisco, Cal., Motor Truck Show, Coliseum Hall, *Motor Field*.
April 5-19.....Pittsburgh, Pa., Annual Show, East Liberty Market House, Dealers' Association.

Race Meets, Runs, Hill Climbs, Etc.

May 5-8.....Washington, D. C., Motor Truck Reliability Run, *Washington Post*.
May 30.....Indianapolis, Ind., 500-Mile Race, Speedway.
July 1.....Indianapolis, Ind., Tour of Indiana Automobile Manufacturers' Association to the Pacific Coast.
July 27-28.....Tacoma, Wash., Tacoma Road Races.
Nov. 24.....Savannah, Ga., Vanderbilt Cup Race, Motor Cups Holding Company.
Nov. 26.....Savannah, Ga., Grand Prize Race, Automobile Club of America.

Foreign

March.....France, Sealed Bonnet, 3000-Mile Run.
March 31.....Montevideo, Uruguay, International Competition of Agricultural Motor Vehicles.
April.....Barcelona, Spain, International Exhibition.
May.....St. Petersburg, Russia, International Automobile Exposition, building of Michael Maneze, Imperial Automobile Club of Russia.
July 12.....Amiens, France, Grand Prix Race.

Marathon Factory Completed—The factory of the Marathon Tire & Rubber Company, Cuyahoga Falls, O., is completed.

Pilot's Addition—The Pilot Motor Car Company, Richmond, Ind., has awarded plans for an addition which will be 46 feet by 120 feet and two stories high.

Fiat Will Increase Factory—The F.I.A.T. Company, Poughkeepsie, N. Y., will increase the size of its automobile factory with 30,000 square feet of additional floor space.

Reorganize Automobile Works—J. G. Cleary, of Milwaukee, Wis., who recently purchased the Findlay Motor Works, will probably reorganize the company and put it in operation at once.

Chandler Selects Site—It is announced that the Chandler Motor Company, in which Detroit, Mich., men are interested and which has recently been organized, will build a plant in Cleveland, O., the site having been secured along the Belt Line Railroad.

Scharf Gearless Building—The Scharf Gearless Motor Company, Richmond, O., which was recently incorporated with a capital of $10,000 by G. W. Worden and others, is planning the erection of a plant for the manufacture of a new gearless motor.

Overland Buys Toledo Land—The Willys-Overland Company, Toledo, O., by a recent purchase of $10,000 worth of land has secured complete control of all property between West Central avenue, where the large factory is located to the boulevard. The land was purchased with a view to future expansion of the factory.

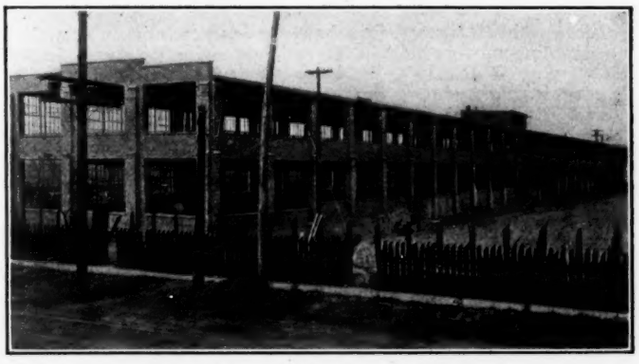
Wilboken Establishes Quarters—The Wilboken Manufacturing Company, Milwaukee, Wis., recently incorporated for $50,000, has established headquarters and a factory at 248 Reed street for the manufacture of air compressors for automobiles, electric air compressors for garages and other purposes and a line of mechanical specialties. G. C. Knaak is president and general manager.

Garage Equipment to Build—The Garage Equipment Manufacturing Company, Milwaukee, Wis., has been granted a permit to build a $7,500 addition to its works. The company is just getting back into its normal stride after the fire early in January. The addition will make possible more nearly an approximation of production in relation to orders on hand.

Ford's St. Paul Plant—Factory architect Graham of the Ford Motor Car Company, Detroit, Mich., recently went to St. Paul, Minn., to look over the site purchased by that firm. It was originally planned to hold a large retail store on a site in Minneapolis and to erect a big assembling plant also there, but a difference of opinion arose and so the Ford people are now thinking of building the factory in St. Paul.

Maxwell Offices Moved—The offices of the Maxwell Motor Car Company, Dayton, O., will be removed to the North Dayton, O., plant. Additional employees are being taken on at the plant and President Walter Flanders states that the output this year will be between 20,000 and 25,000 cars. The Maxwell company will use $500,000 worth of drop forgings a year and plans are being made for opening up a foundry to furnish them.

Erie to Have Plant—George McLaughlin, of Erie, Pa., has organized a company, capitalized at $100,000, to manufacture motor trucks, ranging in capacity from 1 to 4 tons. Twelve carloads of material, which will arrive in the near future, have been purchased and manufacturing will commence as soon as the necessary machinery arrives and can be installed. Until a larger and more suitable building can be obtained, the present plant occupied by Mr. McLaughlin will be used.



One of the recent additions to the plant of the Motor Car Manufacturing Company, Indianapolis, Ind.

News of the Week Condensed

AGAINST Reckless Driving—The Legislative Committee of the St. Louis, Mo., Automobile Club has presented to the House of Delegates the views of 750 of its members on the proposed new ordinances which affect the automobile user. The letters all expressed a sentiment against reckless driving. The club wants better traffic conditions.

Perry Has Club—Fifty motorists of Perry, N. Y., have formed the Perry Automobile Club.

Millikin Sales Manager—J. F. Millikin has joined the Spokane, Wash., Auto-Truck Company in the capacity of sales manager.

Ridler Pope Sales Manager—F. M. Ridler has been appointed sales manager of the Pope Manufacturing Company, Hartford, Conn.

Lyons Manager Capitol Body—W. A. Lyons has been made general manager of the Capitol Body Company, recently organized in Indianapolis, Ind.

They Certainly Need Them—Automobiles that are bullet-proof are being advertised by a dealer in Mexico City, Mexico, who knows what the public wants.

Washington Franklin Firm Moves—S. S. Smith & Company, Franklin's dealers in Washington, Ia., recently moved into new quarters on South Marion avenue.

Diefenderfer Manager N. Y. Lozier—A. G. Diefenderfer's appointment as manager of the New York City branch of the Lozier Motor Company, has been announced.

Little Sales Manager Borland—W. C. Little, assistant sales manager of the Lozier Motor Company, Detroit, Mich., goes to the Borland-Grannis Company, Chicago, Ill., on March 1. His new position will be that of sales manager.

Cross Holly Sales Manager—The Holly Brothers Company, Detroit, Mich., carbureter maker, announces the appointment of C. W. Cross as sales manager. Mr. Cross was formerly with the General Motors Truck Company.

Brady General Manager—The Aluminum Castings Company, Cleveland, O., announces the appointment of Charles Brady as general manager of the aluminum foundries.

Baldwin with Stewart-Warner—R. H. Baldwin, formerly with the Standard Speedometer Company, has joined the Stewart-Warner Speedometer Corporation's forces, Chicago, Ill. He will be connected with the Detroit, Mich., office.

Want Roads Cleared—The Connecticut Automobile Association, Hartford, Conn., will lend all effort for the enactment of a bill providing that road side brush, small trees, vines and low-lying branches at corners, intersections, curves and the like be removed to provide a clear vision.

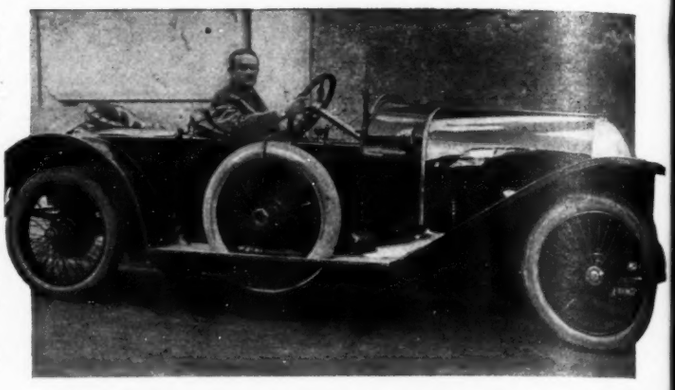
Newark License Office to Move—On May 1 the Newark, N. J., office of the New Jersey State Motor Vehicle Department will move with the N. J. Automobile and Motor Club to the corner of Central avenue and Halsey street.

Motors in Railway Coaches—Railway coaches propelled by gasoline motors will be placed in service by the Chicago, Milwaukee & St. Paul Railway Company on March 1 between Milwaukee, Pewaukee and Waukesha, Wis. Five coaches will comprise the initial equipment of the division.

Martin from Firestone to Stewart—F. H. Martin, recently with the Firestone Tire & Rubber Company, has accepted the position of Eastern sales manager of the Stewart-Warner Speedometer Corporation, Chicago, Ill., and will assume his new duties on March 1, with headquarters in New York City.

Chauffeurs' Bureau in Hartford—The establishment of a chauffeurs' bureau is under advisement by the Automobile Club of Hartford, Conn. It is the intention to keep a file of complete data which would have a tendency to weed out the undesirable sort.

Jacksonville to Atlanta Tour—A representative of the Board of Trade of Jacksonville, Fla., is authority for the statement that arrangements are almost perfected for a tour from Jacksonville to Atlanta for the grand opera week in April. The tour will be made by 100 cars. The scout car for the tour will leave Jacksonville some time in the near future.



A three-seater torpedo on Bellanger chassis. This car is built by the Gregoire Company, Poissy (S-O) et Asnières (Seine), and carries a Daimler-Knight motor. Marquis de Soriano, a leading Spanish sportsman, is at the wheel

New York Got $1,000,000—That the automobile yielded more than a million dollars in revenue to N. Y. State during 1912 is disclosed in the report of the Secretary of State's office for the past year. The registrations were divided as follows: pleasure vehicles, 95,484; commercial cars, 9,767; dealers, 1,716, and exempt vehicles, 295. The revenue collected for the year was $1,047,678, an increase of $132,155 over 1911.

Electrical Society Will Meet—The Society for Electrical Development, New York City, will hold a meeting on March 4 and 5 in the large meeting room in the Engineering Societies Building, 29 W. 39th street, that city. The society has been organized to assist in the development of the electrical industry throughout the country. A number of papers dealing on modern electrical problems will be read at the meeting by prominent men in the industry.

Connecticut Foreign Trucks Registered—As was expected the intention of putting through the Connecticut legislature a bill compelling foreign motor trucks to be registered in that state has caused much comment. Among other factions the Connecticut Automobile Association made up of state clubs affiliated with the A. A. A. are loud in denunciation of the proposed measure. The contention is that the bill is a direct contradiction of the state association avowed policy to make Connecticut a wide open state.

New Western Automobile Rates—Application of the new automobile insurance rates in the West has been postponed until March 15, before which time the two Eastern members of the executive committee of the Western Automobile Underwriters' Association will have been selected and a conference, can be held for an adjustment of the entire situation. The important changes from the present agreement are that the limitation of agents is made two instead of three, all features of automobile insurance are covered instead of only fire and theft.

Foreign Credits—A book of very practical value to every firm engaged in the export trade or planning to enter the foreign field has recently been issued by the Bureau of Foreign and Domestic Commerce. It deals with the credit problem. An important series of consular reports from all parts of the world is included. In these reports American consular officers describe fully the local credit conditions. Copies of the book, special agents series No. 62, may be obtained upon application to the superintendent of documents, government printing office.

New Agencies Established During the Week

PLEASURE CARS

Place	Car	Agent
Ayr, N. D.	Henderson	Ayr Auto Co.
Barnesville, Minn.	Henderson	C. C. Dunn
Bellwood, Pa.	Henderson	R. D. Bell
Brooklyn, N. Y.	Henderson	Central Motor Car Co.
Casey, Ill.	Henderson	C. W. Shimel
Columbus, O.	Stutz	Emil Stutz
Dayton, O.	Stoddard-Dayton	C. J Schellmann
Dubuque, Ia.	Pullman	O. S. Montz
Des Moines, Iowa	Henderson	Guarantee Motors Co.
Dover, N. H.	Pullman	Pershaley & York
East Liverpool, O.	Buick	Tri-State Gar. Co.
Emerson, Neb.	Moon	Lindering & Kerwin
Emmett, Neb.	Moon	O. B. Lawrence
Enfield Center, N. H.	Henderson	Myrl L. Currier
Fennimore, Wis.	Ford	Horton Automobile Co.
Findlay, O.	Buick	W. E. VanEmathas
Findlay, O.	Metz	Lundy & Bartonhave
Findlay, O.	Reo	Collingwood & Edwards
Fremont, Neb.	Moon	A. Koyen
Fresno, Cal.	Paige-Detroit	Roullard-Brown
Hackensack, N. J.	Moon	Chas. H. Lary
Harrisburg, Pa.	Hupmobile	Ensminger Gar.
Harrisburg, Pa.	Mitchell	Ensminger Gar.
Harrisburg, Pa.	Overland	Andrew Redmond
Hartington, Neb.	Moon	Nelson & Roskopf
Hazelton, Pa.	Henderson	H. J. Cuyle & Son
Irene, Texas	Henderson	Geo. J. White
Kalamazoo, Mich.	Imperial	J. H. Duffany
Kewaskum, Wis.	Studebaker	Nicholas Remmel
Lancaster, Wis.	Ford	Horton Automobile Co.
Lancaster, Wis.	Overland	Horton Automobile Co.
Lisbon, N. D.	Moon	W. L. Divet
McCall, S. C.	Henderson	R. L. Adams
Milwaukee, Wis.	Henderson	P. V. Denster
Minneapolis, Minn.	Henderson	Minnesota Motor Car Co.
Napa, Cal.	Henderson	Anger & Knox
New Albany, Ind.	Pullman	F. T. Slider
Niobrara, Neb.	Moon	E. L. Gillham
Oakland, Cal.	Henderson	W. E. Hall Motor Car Co.
Olympia, Wash.	Reo	Blaine Esham
Paducah, Ky.	Pullman	H. J. Livingston
Patch Grove, Wis.	Ford	Horton Automobile Co.
Philadelphia, Pa.	Henderson	Frank Le Flem
Plainview, Neb.	Moon	Geo. W. Kirk
Portland, Ore.	Maxwell	W. C. Garbe
Portland, Ore.	Rambler	G. W. Nelson
Quitman, Ga.	Henderson	Blue Ribbon Garage
San Francisco, Cal.	Empire	McCullough Bros.
San Francisco, Cal.	Mitchell	McCullough Bros.
San Jose, Cal.	Paige-Detroit	Dixon & Evans
Sea Cliff, L. I., N. Y.	Moon	Geo. Fleither
Seattle, Wash.	Michigan	J. F. Campbell
Seattle, Wash.	Rambler	N. J. Morehouse
St. Louis, Mo.	American	General M. Co.
Syracuse, N. Y.	Ford	Perl Devendorf
Syracuse, N. Y.	Moon	King Auto Co.
Thornville, O.	Krit	R. G. Swartz
Tamaqua, Pa.	Henderson	Geo. Pugh
Utica, N. Y.	Franklin	E. F. Benedict
Westport, Conn.	Henderson	C. E. Betts
Wilmington, Del.	American	F. W. Ayres Gar. Co.
Wilmington, Del.	Overland	F. W. Ayers Gar. Co.
York, Pa.	Mitchell	J. W. Richley

COMMERCIAL VEHICLES

Portland, Ore.	Selden	H. L. Keats
St. Louis, Mo.	Garford	Motors Corporation
St. Louis, Mo.	Lauth-Juergens	Muehling M. C. Co.
St. Louis, Mo.	Lippard-Stewart	Brinkman M. C. Co.

ELECTRIC VEHICLES

St. Louis, Mo.	Century	Raymond Mancha

White with Cole—J. L. White has joined the Cole Motor Car Company, Indianapolis, Ind., as purchasing agent.

Copper on Moon Staff—George Copper has joined the testing staff of the Moon Motor Car Company's factory in St. Louis, Mo.

East with Timken—G. L. East has become assistant advertising manager of the Timken-Detroit Axle Company, Detroit, Mich.

Skinner Opens Store—Richard C. Skinner, Connecticut representative of the Hood Rubber Company, has opened a store in Hartford, Conn.

Hathaway Kelly Manager—D. C. Hathaway has been appointed manager of the Kelly-Springfield Motor Truck Company's branch at Cleveland, O.

Potts Cole Motor Inspector—The Cole Motor Car Company, Indianapolis, Ind., has appointed E. R. Potts as chief motor inspector at the Cole plant.

Meade Superintendent Moon—J. J. Meade is the new superintendent of the motor building department of the Moon Motor Car Company, St. Louis, Mo.

Joyce Philadelphia Manager—James Joyce has been appointed manager of the Philadelphia, Pa., branch of the Kelly-Springfield Motor Truck Company, Springfield, O.

Detroit Supply House Purchased—The stock of the Detroit Motor Supply Company, Detroit, Mich., which has gone out of business, has been purchased by Heyn's Bazaar, that city.

Open Sheet Metal Works—W. A. Lang & Sons have opened a sheet metal works at 513 North Hamilton street, Saginaw, Mich., where they will do automobile radiator and muffler repairing.

Rohde Sails—O. J. Rohde, with a corps of magneto experts, sailed recently to Europe to establish headquarters in London, England, where they will attend the wants of those who are using the products of the Splitdorf Electrical Company, New York City.

Jones Buys Moyer Agency—G. W. Jones has purchased the controlling interest in the Moyer Automobile Company, Des Moines, Ia. Mr. Jones was manager of the United Motors Des Moines Company up to the time it was taken over by the Flanders interests.

Johns-Manville Salesmen's Conventions—Following a long-established custom, the 600 or more salesmen of the H. W. Johns-Manville Company, New York City, assembled in annual conventions on various dates from January 2 to February 8 in their respective districts to learn more about the products they sell.

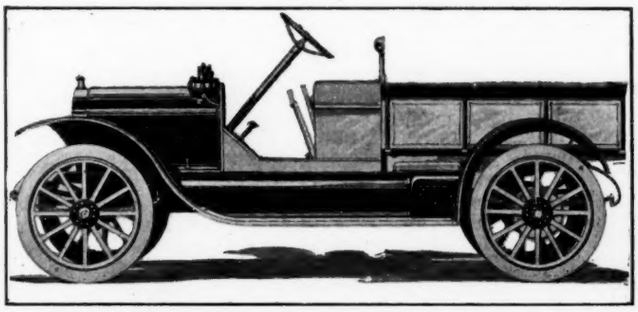
Automobiles on the Lakes—Automobile travel on the lake steamers last year was very large. During the season 1912 there were carried on Lake Champlain 1364 cars, as against 100 the previous year. On Lake George the increase is even more marked, there being transported in 1912 1335, as against 520 the year before.

Big Garage Fire—The garage and warehouse of the Manhattan Garage & Express Company, doing a public garage, car storage and trucking business, Milwaukee, Wis., was totally destroyed by fire February 12. Twenty-three cars of private owners were destroyed. The loss is $65,000, partly covered by insurance.

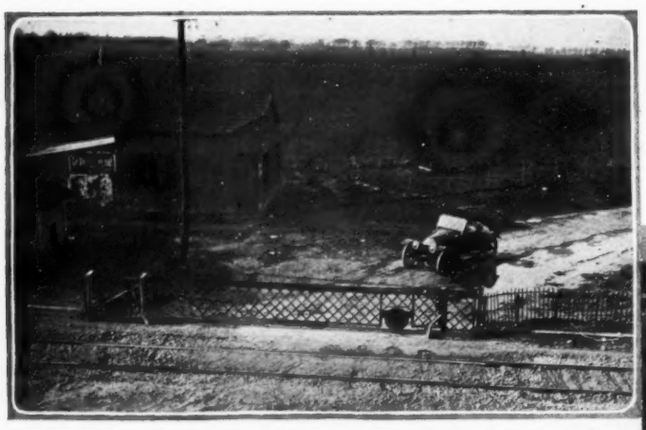
Fire in Washington—More than $9,000 damage was sustained by David S. Hendrick, G. R. Cowie Company and the Motor Truck Corporation, Washington, D. C., when a fire broke out Friday afternoon in the Hendrick garage. Of this amount $5,000 was sustained in damage to cars and the remainder to the buildings.

Made-in-Racine Show in June—A mammoth Made-in-Racine exposition, in which the automobile, truck and parts trades will have particular representation, will be held in the largest auditorium of Racine, Wis., in June under direction of the Commercial Club. Incidentally the club will wage a campaign to advertise Racine industries by means of pamphlets.

Commercial Rubber in Receiver's Hands—The New York Commercial Company, New York City, a large importer of crude rubber, whose assets, according to a financial statement issued recently, were $6,495,000, was put in the hands of the receiver recently. The application for receivership was made by J. N. Taylor, counsel for A. H. Alden & Company, Ltd., of London, Eng., who presented a claim for $28,000.



New light delivery truck recently announced by the Thomas B. Jeffery Company, Kenosha, Wis., manufacturer of the Rambler car. This car is distinguished by its unusually low price



Abolition of grade crossings in France. Entrance to the old grade crossing at Lieusant, on the Paris-to-Fontainebleau main road. This crossing has been abolished by the building of a road over the railway by the P. L. M. Railroad Company

New road over railway to avoid the grade crossing at Villeneuve St. Georges, on Paris-Fontainebleau road. The P. L. M. Company has to abolish all grade crossings on its lines, this being one already completed

Automobile Service in Medellin—A concession has been granted by the Columbian government for the establishment of public automobile service in Medellin.

Fees Larger in 1913—Fees collected by the secretary of state in the automobile registration department exceed the returns of 1912 by $6,000 for the months.

Fire Engine for Abeline—A motor-driven fire engine is to be purchased by Abeline, Tex. The city council authorized a maximum expenditure of $7,500 for the new engine.

Case Continues Racing—The J. I. Case Threshing Machine Company, Racine, Wis., manufacturing Case cars, will continue its track and road racing campaign during 1913.

Bus Line in Bedford—The Bedford Motor Bus Company is being organized at Bedford, Ind., to install a motor bus service. Four Buick cars each with a capacity of twenty passengers will be installed.

Lima's Speed Limit 15 Miles—A speed limit of 15 miles per hour has been made by a recent ordinance in Lima, Peru. The number of automobiles in the Peruvian capital is increasing rapidly.

Bus Line at Unionville—An automobile bus line has been established at Unionville, Conn., and will conduct a regular schedule between that town and Collinsville, carrying passengers and freight.

Newark Orders Fire Engine—The fire company at Newark, Del., has decided to order a $7,500 triple combination automobile fire engine from the United States Fire Apparatus Company, Wilmington.

Lander Manager Hagstrom—Upon the retirement of P. E. Zimmerman as manager of the Hagstrom Brothers Manufacturing Company, Lindsborg, Kans., this company will now be under the management of Mr. Charles Lander.

Panama Rubber Elects Officers—The following officers were elected by the newly organized Panama Rubber Company at San Francisco, Cal.; W. D. Newerf, president; W. E. McCune, first vice-president; J. S. Benner, secretary, and J. F. Roe, treasurer.

California Registrations Increased—The registration of automobiles for January, 1913, at Sacramento, Cal., presents some interesting figures. During the first month of the year 2,790 automobiles were registered, as against 2,594 for the same month of last year, a gain of almost 200.

Uruguay's Bus Lines Successful—The successful operation of motor buses in Montevideo, Uruguay, has caused a most favorable impression. An appropriation of $350,000 has been made by the government for the purchase of more vehicles of this type, which will run on regular schedules from the capital to points in the interior.

Havana Wants Two Ambulances—Two automobile ambulances have been authorized by the municipal council of Havana, Cuba. The sum of $10,000 was set aside for their purchase. No purchase will be made for several weeks in order that an opportunity may be given for the receipt of bids from companies in the United States and in France.

Washington's Road Fund—The first step toward raising by direct taxation a public road fund, which will reach $10,000,000 in the next 2 years was taken in the house of representatives at Olympia, Wash., recently. The measure passed fixes the road levy at 1½ mills. This will net approximately $3,000,000. There is already $1,000.000 unexpended in the state highway fund.

Ohio Road Bill Passed—The Ohio senate enacted a law styled the Weiser bill, which validates road improvement

Automobile Incorporations

AUTOMOBILES AND PARTS

COLUMBUS, O.—New Columbus Automobile Company; capital, $30,000; to manufacture automobiles. Incorporators: Jesse J. Brown, L. M. Brown, W. E. McConnonn, C. E. Dennis, E. B. Dennis.

EL PASO, TEX.—Longwell Automobile Truck and Sales Company; capital, $10,000; to deal in motor trucks. Incorporators: J. J. Longwell, H. M. Andreas, J. A. Tays.

HUNTINGTON, W. VA.—Jarvis-Huntington Automobile Company; capital, $100,000; to manufacture and sell automobile and motor trucks and operate a garage. Incorporators: Mrs. R. J. Poster, G. G. Poster, R. D. Seaman, T. L. Millard, F. C. Pifer.

INDIANAPOLIS, IND.—Northern Auto Company; capital, $10,000; to deal in automobiles. Incorporators: J. J. Clements, R. M. Fleming, L. H. Van Briggle.

JACKSONVILLE, FLA.—Gallatin Motor Company; capital, $10,000; to deal in automobiles. Incorporators: H. T. Phillips, Harry Botts.

LIMA, O—Gladwill Crossley Motor Company; capital, $10,000; to deal in automobiles. Incorporators: A. J. Gladwill, C. E. Crossley, F. N. Holland, H. J. Bland and J. W. Roby.

LOCKPORT, N. Y.—Amper Electric Company; capital, $25,000; to manufacture automobiles and automobile locks. Incorporators: T. D. Robinson, E. W. Jones, C. L. Nichols.

MILWAUKEE, WIS.—Oakland-Wisconsin Motor Company; capital, $50,000; to deal in automobiles. Incorporators: R. A. Creek, A. H. Small, N. M. Creek.

MOBILE, ALA.—Mobile Overland Automobile Company; capital, $5,000; to conduct a general sales agency. Incorporator: Norman Richards.

NEW YORK CITY.—K-E-W Manufacturing Company; capital, $5,000; to deal in automobiles. Incorporators: John Jacobs, W. W. Ward, J. A. Bednarik.

NEW YORK CITY.—Willets Service Company; capital, $50,000; to deal in automobiles and motor trucks. Incorporators: W. C. Willets, Marius Jurgensen, Estelle M. Naylor.

NEW YORK CITY.—E. C. Pardee; capital, $65,000; to deal in engines and motors. Incorporators: K. T. Frederick, C. R. Dewey, L. F. Sniffin.

OSHKOSH, WIS.—Oshkosh Automobile Dealers' Association; capital, $1,000; to conduct a wholesale and retail business in automobiles, to promote and conduct exhibitions of automobiles. Incorporators: J. A. Crum, F. S. Hoaglin, A. Thom, W. F. Scoular.

PETERSBURG, VA.—Virginia Motor and Machine Company; capital, $10,000; to manufacture automobiles and parts. Incorporators: W. E. Wells, C. F. Denton, J. B. Andrews.

RICHMOND, VA.—Waynesboro Automobile Company; capital, $15,000; to deal in automobiles. Incorporators: B. E. Watson, J. B. Young, H. M. Hanger.

SARATOGA SPRINGS, N. Y.—Ross-Ketchum Company; capital, $18,400; to deal in automobiles. Incorporators: J. A. P. Ketchum, N. E. Ross, J. W. Northrup.

UNIONTOWN, PA.—Automobile Service Company; capital, $5,000; to paint, repair, buy and sell automobiles and motor vehicles. Incorporators: C. W. Johnson, Fred A. Close, B. F. Hall.

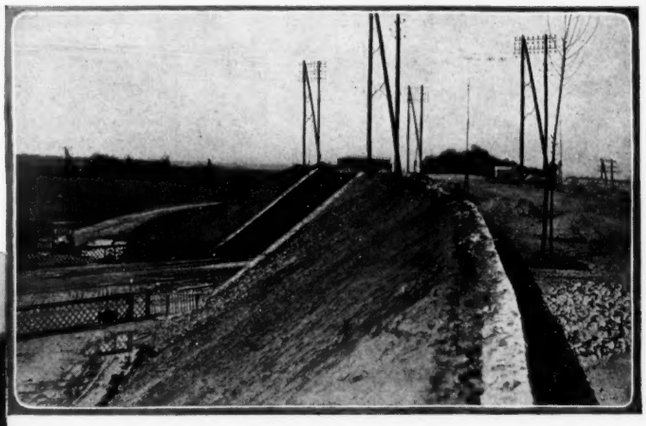
WEST ALLIS, WIS.—Auto Transfer Company; capital, $5,000; to operate an automobile express and transfer line throughout West Allis, the manufacturing suburb of Milwaukee, and between West Allis and other suburbs.

WILMINGTON, DEL.—Lewis Motor & Engineering Company; capital, $200,000; to manufacture automobiles and parts. Incorporators: G. D. Hopkins, G. W. Dillman, S. M. Crawl.

GARAGES AND ACCESSORIES

BANGOR, ME.—Penobscot Garage Company; capital, $10,000; to carry on a garage business. Incorporators: A. J. Shorey, C. H. Shorey.

New road over the railway at Villeneuve St. Georges, on the Paris-Fontainebleau road, avoiding the use of the grade crossing. This is part of a scheme of the Paris, Lyon, Mediterranean Railway Company to abolish all grade crossings on main lines



Spot on the main road from Paris to Fontainebleau at which a dangerous grade crossing existed. This has now been abolished by the P. L. M. Railroad Company building a bridge over the line

contracts which cover 25 counties and comprise hundreds of miles of improvement. The supreme court annulled the Garrett law which by implication invalidated the road contracts.

Davis Locomobile Truck Advertiser—W. H. Davis, Jr., has been placed in charge of the truck department advertising of the Locomobile Company of America, Bridgeport, Conn.

Fort Dodge Show Opened—The second annual Northern Iowa Automobile Show opened at Fort Dodge, Ia., recently. The Fort Dodge Dealers' Association is running the show.

Childs Promoted—H. P. Childs, branch manager of the International Motor Company, Philadelphia, Pa., was recently promoted to be assistant Eastern sales agent of the company.

Jacox Loses Manager—M. M. Wilcox, General Manager of the Jackson-Church-Wilcox Company, Saginaw, Mich., has resigned to become interested in the manufacture of automobile accessories.

Holland With Anderson Electric—The Anderson Electric Car Company, Detroit, Mich., announces the appointment of W. E. Holland as manager of its mechanical and electrical research department.

Studebaker In New Home—The Studebaker Corporation, Detroit, Mich., has taken possession of its new wholesale branch at 61 Pierce street, Washington, D. C., giving it a capacity of 41,000 square feet on one floor.

Receives Russian Gold Medal—The Pullman Motor Car Company, of York, Pa., has received the third annual gold medal from the Russian Government for Pullman cars entered in the recent government exhibition.

Dunlop Manufacturing Fabricord Tires—The Dunlop Tire & Rubber Company, New York City, recently reached an agreement with the Century Rubber Company for the exclusive use and manufacture of Fabricord tires in Canada.

By Way of Correction—In the January 16 issue of THE AUTOMOBILE the Packard truck should have been described as having roller bearings on the rear axle instead of ball bearings, and also the outside drive coupe model should have read cabette model.

New Omaha Association—An association by the name of the Automobile Supply Jobbers' Credit Association, was recently formed in Omaha, Neb., for the purpose of protecting its members in matters of credit and for the betterment of trade conditions in that territory. C. G. Powell was elected president.

Bus Monopoly Under Attack—A blow at the New York City stage-coach monopoly is aimed in a bill introduced in the Legislature, the intent of which is to allow prospective competitors of the Fifth Avenue Stage Coach Company to operate lines throughout Manhattan and to open up routes in the other boroughs.

Missouri Clubs After Garagement—The St. Louis Automobile Manufacturers' and Dealers' Association, jointly with the dealers of Kansas City and St. Joseph, has introduced in the Missouri legislature a bill to give a lien on automobiles for storage and repair charges. The bill guards the owners from overcharging by unscrupulous repair men.

New Canadian License Bill—A new bill is being prepared in Canada which calls for the repeal of all present legislation in regard to licensing automobiles and suggests a scale of weights and rates as follows: 30 cents per 100 pounds on cars up to 2,000 pounds in weight, 40 cents per 100 pounds on cars up to 4,000 pounds, and 50 cents per 100 pounds on cars over 4,000 pounds.

Automobile Incorporations

BROOKLYN, N. Y.—Cumberland Garage Company; capital, $25,000; to engage in garage business. Incorporators: W. L. Gray, A. W. Wilmarth, Marie F. Wilmarth.

BROOKLYN, N. Y.—Caton Garage; capital, $10,000; to carry on a garage business. Incorporators: Frank Lemmer, John Carlson.

BUFFALO, N. Y.—Conover Limousine Top Company; capital, $125,000; to manufacture automobile tops and bodies. Incorporators: R. J. Conover, C. B. Anglin, J. T. Gilbert.

CHICAGO, ILL.—Lacy Motor Delivery Company; capital, $10,000; to carry on an automobile delivery. Incorporators: Herbert Decker, Franklin H. Lacy, Samuel J. Richman.

CLEVELAND, O.—National Garage Company; capital, $20,000; garage automobile livery and general automobile trucking. Incorporators: J. A. Nally, G. A. Gardner, G. L. Williams, E. G. Nally.

COLUMBUS, O.—Automobile Protective Association Company; capital, $5,000; to guard owners against the theft of their automobiles or parts thereof, etc. Incorporators: William Loster, M. A. Capute, H. H. Switser, E. L. Richards, A. O'Hara.

DETROIT, MICH.—Universal Wheel Company; capital, $250,000; to make a demountable type of wheel. Incorporators: J. P. Lavigne, W. F. Woodhouse, John Wynne, Jr., J. J. Knight.

LYNCHBURG, VA.—Sterling Electric Company; capital, $5,000; to deal in electric accessories. Incorporators: A. N. Carroll, J. C. Oakes, E. B. Templeton.

NEW YORK CITY—No Shock Wheel Company; capital, $400,000; to deal in automobiles, tires, automobile parts, etc. Incorporators: J. W. Ebbs, R. H. Waddell, A. A. Kelley.

NASHVILLE, TENN.—Capitol Body Company; capital, $10,000; to manufacture automobile bodies. Incorporators: Elmer Hinshaw, R. Coghill, Fred W. Henschen, W. A. Lyons, Elmer W. Hughey.

PERU, IND.—Peru Tire & Rubber Company; capital, $25,000; to buy and sell automobile and other tires. Incorporators: C. E. Miller, Oliver J. Tilettl, Ira H. Stanter and Lee Miller.

ROCHESTER, N. Y.—Central Motor Supply Company; capital, $20,000; to deal in automobile supplies. Incorporators: P. B. Barager, R. F. Close, William Wood.

RICHMOND, VA.—Craig Transfer and Motor Car Company; capital, $5,000; to carry on an automobile transfer business. Incorporators: M. C. Boyden, W. W. Johnson, J. P. Jones.

SHERBROOKE, IND.—Connecticut Mills Company; capital, $1,000,000; to manufacture auto tire fabric.

WASHINGTON, D. C.—Dispatch Taxicab Service; to carry on a taxicab service. Incorporators: C. E. Miller, Claude E. Miller, G. W. Pierre.

YOUNGSTOWN, O.—Youngstown Automobile Show Company; capital, $1,000; to hold automobile shows.

CHANGES OF CAPITAL AND NAME

BOWLING GREEN, O.—Century Auto & Garage Company; capital increased from $6,000 to $15,000.

BOWLING GREEN, O.—Bowling Green Motor Car Company; capital increased to $100,000.

DETROIT, MICH.—Commerce Motor Car Company; capital increased from $50,000 to $100,000.

BUFFALO, N. Y.—Willet Engine & Carbureter Company; change of name to the Willet Engine & Truck Company, Inc.

TOLEDO, O.—Toledo Tire & Repair Company; change of name to the Toledo Tire and Supply Company.

TOLEDO, O.—Mather Spring Company; capital increased from $100,000 to $300,000.

XENIA, O.—Baldner Automobile Manufacturing Company; capital increased from $5,000 to $150,000.

CARBURETER—in which a venturi tube is used, the diameter of which is varied by a ball contained in the second section of the venturi passage and supported by a cross pin.

The subject matter of this patent is a carbureter Fig. 1, the casing of which contains a main air inlet A from which the air passes through an angular venturi passage over a gasoline nozzle N, and thence through the throttle way to the intake pipe of the motor. A throttle of the butterfly type serves for regulating the quantity of mixture fed to the motor and a ball B, contained in the second section of the venturi passage and supported by a cross pin Q serves to accentuate the suction effect.

No. 1,052,897—to James M. Dayton, Torrington, Conn., assigned to Excelsior Needle Company, Torrington, Conn. Granted February 11, 1913; filed April 9, 1910.

Automobile Tire Tread—The band carries a channeled member supporting links which engage the road bed.

This patent refers to a tread band design as that shown in Fig. 2, where the tire is fitted with a tread based plate B, which is formed with projections B 1. The holes C 1 of a channeled member C engage the projections C 1 and a series of links L are in place in the channel and their surfaces in contact with the road surface. Between each two adjacent runs of links leather strips are in place and transverse rods R hold the links in the channeled member C.

No. 1,052,560—to John Carter Barry, Harrow, England. Granted February 11, 1913; filed October 14, 1910.

Automobile Engine Cleaner—Consisting of a rotary hammer which is carried in a flexible casing and driven by a suitable motor.

Fig. 3 shows the engine cleaner described in this patent, which consists of a flexible shaft F equipped with a handle H and a hammer K, which is directly and rigidly secured to the free end of F. The hammer K has an unbalanced portion on one side of the shaft center and by means of a suitable motive power the shaft may be rotated, thereby producing a series of successive blows on the surface being cleaned.

No. 1,053,007—to George Calvert, Stoke Newington, London, England, assigner to Mechanical Decarbonizer Syndicate, Ltd., London, England. Granted February 11, 1913; filed March 7, 1911.

Valve Compressing Tool—Consisting of a tongue with suitably designed terminals.

The tool shown in Fig. 4 consists principally of two members which are connected in the fashion of a tongue. One of these members has an elongated slot with an orifice extending into the same, there being a lateral recess in the member extending from the slot; a forked terminal formed on the member is disposed at an angle to the body of the same. The second member has a terminal which is adapted to be introduced into the slot, at the lateral recess, mentioned above. A terminal of the second member is greater in width than the slot, but less in width than the slot and the recess; the other terminal of the second member is forked and positioned at an angle to the body of the member, in which the latter are formed a number of orifices. A pin is in place in the orifices in the first and second members.

No. 1,052,941—to Charles Nyberg, Huntington, N. Y. Granted February 11, 1913; filed October 25, 1911.

Automatic Carbureter—in which a gate valve designed for throttling the motor is connected to the fuel needle to maintain a constant fuel-air ratio.

This carbureter, Fig. 5, consists of a casing C, which is formed with a float chamber F and a carbureting chamber D, the bottom of the latter being designed with an extension formed with the passageway P. This passage communicates with the float chamber and a guide way is formed in the carbureter chamber D; in this guide a gate J is mounted and provided with a needle valve extending through the upper end of the passage P, so as to be capable of closing the same when the gate closes the guide of the carbureting chamber. By this means the intake of air and gasoline are simultaneously operated and a constant ratio of gasoline and air is maintained at all speeds.

No. 1,053,136—to Carl R. Daellenbach, Ellwood City, Pa. Granted February 11, 1913; filed January 27, 1911.

Treating Battery Separators—Consisting in the impregnating of the wooden separators sulphurous salt solution.

This process consists in the treating of wood separators for storage batteries. The separators are immersed in aqueous solution of neutral sodium bisulfate while the solution is maintained at a temperature between 100 and 175 degrees C. The products of decomposition are washed from the treated wood after which the wood is dried under pressure.

No. 1,052,851—to James M. Skinner, Philadelphia, Pa., assignor to Philadelphia Storage Battery Company, Philadelphia, Pa. Granted February 11, 1913; filed March 13, 1912.

Vehicle Wheel—The spokes of which are formed of flat springs secured at their ends to the felloe and to the hub, respectively.

In this wheel the spring spokes are formed from flat strips of springs metal, one end of which is secured to the felloe. The main portion of each spring is curved and is doubled upon itself so as to form an eye; an auxiliary spring portion is curved on a flatter curve than the main spring and its free end only bears against the concave side of the main spring portion, being slidable on the same.

No. 1,053,889—to Joseph Frank Starbuck, Philadelphia, Pa. Granted February 18, 1913; filed April 24, 1912.

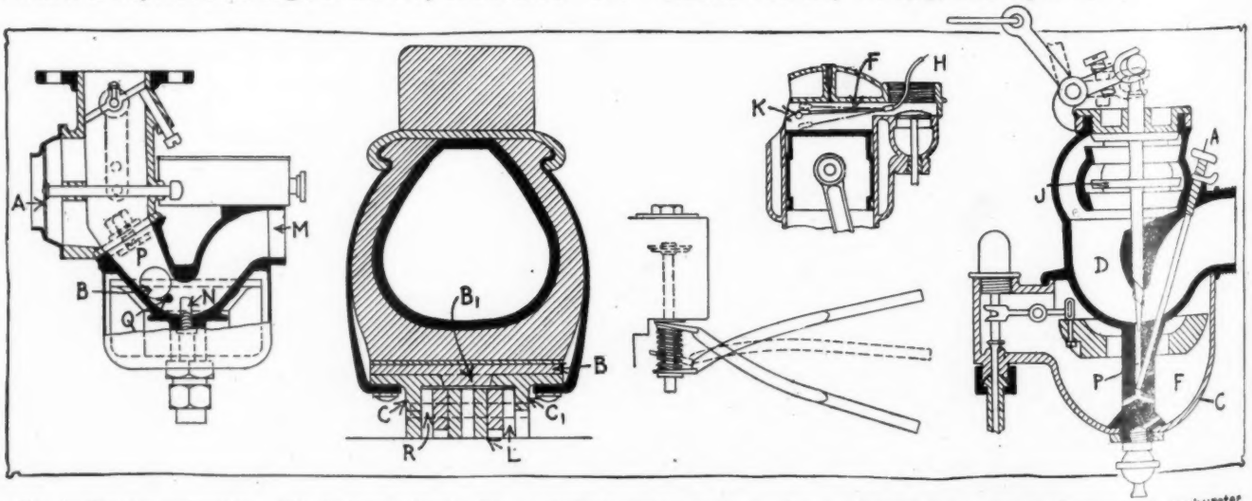


Fig. 1—Dayton carbureter. Fig. 2—Barry tread. Fig. 3—Calvert engine cleaner. Fig. 4—Nyberg tool. Fig. 5—Daellenbach carbureter